# SPEECH CORRECTION

BORDEN AND BUSSE

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# PREFACE

Good speech is universally recognized today as an economic, social, and cultural asset of the first rank. Yet in the United States the problem of defective speech grows daily more acute.

Nasality; harsh, unpleasant production of tone; slovenly, indistinct articulation of sound units; enunciation distorted by organic malformations and diseases; provincial and foreign dialect; lisping; mouthing; stammering—all contribute to the lowering of our national speech standards.

It is hence most desirable that there be evoked a general application of attention to the problems of *speech correction* and a concerted, systematized effort in the home, public school, and college directed towards their solution.

To this end we earnestly dedicate the present volume, hoping that it may place in the hands of those most intimately concerned—the mother, the school teacher, the college instructor of Public Speaking, the family physician, and above all, the *speech specialist*—a body of information which will make possible the accurate diagnosis and effective treatment of all ordinary speech defects.

Speech defects rooted in psycho- or neuro-pathology we do not consider as "ordinary." We have undertaken, therefore, but a brief discussion of the former and have refrained from a discussion of the latter altogether.

In the preparation of this text we are indebted to writers, past and present, who have discussed the subject of speech correction and its allied sciences. We are also indebted to our professional colleagues and friends who have aided us with their valued counsel and criticism—in particular, to Professors Archibald L. Bouton, James A. Lough, Earl B. Babcock, G. Rowland Collins; Mr. Charles A. Dwyer; A. A. Brill, M.D., E. Wallace MacAdam, M.D. and A. J. Hirsch, D.D.S.

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## CHAPTER I

### *THE MECHANISM OF SPEECH*

For the same reason that no one should attempt the work of a garage mechanic without first acquiring a thorough knowledge of automobile construction and operation, no one should attempt the work of speech correction without first learning how the human speech mechanism is built and how it functions.

To successfully repair automobiles the garage mechanic must know how to examine ignition systems for loose connections and crossed wires, spark plugs for accumulations of carbon, carburetors for clogging foreign substances, brake-bands for burnt-out linings, engines for broken parts—in short, he must know how to test the structural and functional fitness of every important part of every automobile he is called upon to repair. Unless he possesses sufficient technical knowledge of automobile construction and operation to do this, it is impossible for him to succeed in his work.

Similarly it is impossible for anyone to succeed in the treatment of speech defects who does not know how to test the structural and functional fitness of the human speech mechanism—a far more intricate piece of machinery than any automobile ever built. The instructor in the field of speech correction who undertakes to treat a case of nasality, for example, must know how to examine his patient's nasal cavity for deviated septum,

hanging turbinates, polypoid growths, adenoidal vegetation, congenital malformations and miscellaneous infections. Unless he can conduct such an examination, he has no way of knowing whether to refer his patient to a physician for medical treatment—to recommend a few simple rules of speech hygiene—or to embark upon an elaborate course of special gymnastic drills calculated to develop a proper use of the soft palate.

It must hence become apparent that a scientific study of speech defects can begin in only one way—viz., with an analysis of the anatomy and physiology of the human speech mechanism. If the reader will make this analysis before attempting anything further, he will find his subsequent progress rendered enough easier and surer to more than repay him for his pains.

## Major Divisions of the Speech Mechanism

According to its anatomical and physiological adaptations for special duties the speech mechanism falls into four major divisions: (1) The Mechanism of Respiration, (2) The Mechanism of Phonation, (3) The Mechanism of Resonation and (4) The Mechanism of Articulation.

### (1) THE MECHANISM OF RESPIRATION

It is the special duty of the mechanism of respiration [1] to furnish an energic basis for speech in the form of AIR CURRENTS. Respiratory air currents initiate

[1] The mechanism of respiration, it should be noted, does much more than provide an energic basis for speech—altho the latter function is the only one of interest to us in the present study. It also serves to bring fresh, oxygen bearing air into such close and

tones and noises in the human speech mechanism on the same general principle that air blasts set up by an organ pump initiate organ tones and that gusts of wind blowing down a chimney give rise to a varied assortment of whistles and hisses.

To understand how air currents are induced by the respiratory mechanism we must examine in considerable detail the anatomy of the following organs:

(1) The Chest
(2) The Lungs
(3) The Nasal Cavity
(4) The Mouth Cavity
(5) The Pharyngeal Cavity
(6) The Laryngeal Cavity
(7) The Trachea
(8) The Bronchi
(9) The Bronchial Tubes

**The Chest.** The chest (or *thorax*) is an air tight compartment, somewhat conical in shape, which forms the upper half of the body trunk. The framework of this compartment consists of twelve vertebræ of the spine in the rear—the twelve so-called *dorsal* vertebræ—the breast plate in front, and ribs and rib cartilages on the sides. Between and over these lie muscles, whilst the whole is covered snugly by the skin externally and by an elastic membrane known as the *thoracic pleura* on the inside. The upper opening to the chest—at the small end of the cone—is "plugged" by the windpipe, the gullet, the upper

constant contact with the blood supply of the organism that an uninterrupted gaseous exchange (oxygen for carbon dioxide) takes place between the two. This gaseous exchange is necessary for the maintenance of practically all vital functions of the organism.

projecting tips of the lungs and numerous muscles, glands, ducts, nerves and blood vessels. The bottom of the chest—at the large end of the cone—is formed by the *diaphragm*, a powerful sheet of muscle which arches in a convex curve across the body and partitions off the chest cavity from the underlying cavity of the abdomen. The structure of the chest is such that it may be enlarged vertically, laterally and from front to rear as the result of muscular action.

**The Lungs.** The cavity of the chest is occupied by

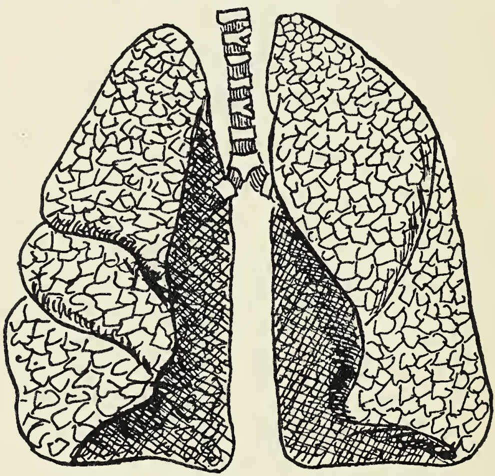


FIG. 1
(*Adapted from Meyer's* "Organs of Speech")
Front external view of human lungs, showing lobular divisions.

the lungs—two large elastic sacs which comprise spongy masses of veins, arteries, air passages, air cells and connective fibres.

Both lungs are divided by long deep fissures into sections known as *lobes,* the left lung (the smaller and narrower of the two) into two lobes and the right lung into three lobes. These lobes are in turn divided into *lobules* and the latter into still smaller structural units. Ultimately the lungs are divisible into some six hundred million tiny chambers known as *alveoli* or air cells, the walls of which are covered with a dense network of capillary blood vessels.[2]

An exceedingly delicate membrane known as the pleura encloses each lung as far as its root (*lung pleura*) and is then reflected on to the inner surface of the chest (*thoracic pleura*). In a state of health the lung pleura lies in close apposition to the thoracic pleura, the two being moistened by a barely appreciable amount of lymph which acts as a lubricant and permits the two surfaces to move upon each other without friction.

A little above the middle of the inner surface of each lung, located slightly to the rear, is the *lung root.* This root is formed by blood vessels which connect the lung with the heart and by the *bronchus* which connects the lung with the windpipe and, thru the latter, with the passages of the larynx, throat, mouth and nose.

**The Nasal Cavity.** The nasal cavity consists of two large irregular passages thru the bones of the face. These passages extend from the narrow openings of the nostrils in front (*anterior nares*) to similar openings into

[2] It is between the blood flowing thru these capillary vessels and the air contained in the alveoli that the gaseous exchange of oxygen for carbon dioxide takes place. As the total alveolar surface of the lungs exceeds 200 sq. meters and the total capillary surface 150 sq. meters, the walls of both being, moreover, exceedingly thin, conditions are rendered ideal for this exchange.

the upper portion of the throat cavity behind (*posterior nares*) and from the base of the cranium above to the roof of the mouth below. They are separated from each other by a thin vertical partition of bone known as the *septum* and are bounded laterally by the *superior, middle* and *inferior turbinated bones.*

Each nasal passage communicates with three fairly large side chambers—the *maxillary, sphenoidal* and *ethnoidal sinuses.* These, while of no importance as air passages, prove useful in a manner we shall note later in a discussion of resonance. The whole of the nasal cavity is lined with a mucous membrane that is continuous at the anterior nares with the outer skin of the face and at the posterior nares with the mucous membrane of the throat cavity.

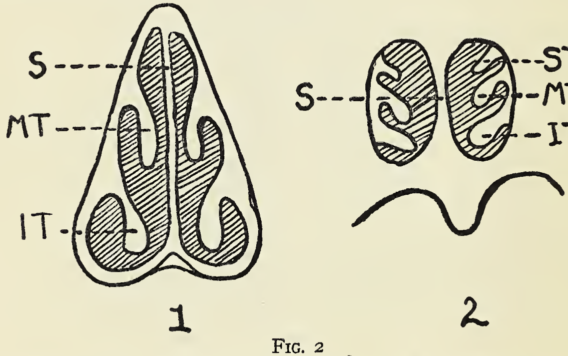



Fig. 2

Diagrammatic representation of nasal cavity as viewed (1) thru the anterior nares and (2) thru the posterior nares, showing septum (S), superior turbinates (ST), middle turbinates (MT) and inferior turbinates (IT).

**The Mouth Cavity.** Directly below the nasal cavity, in a position to replace it as either the entrance or the exit

of the body for respiratory air currents, is the mouth cavity—a moderately wide, oval shaped passage which opens by a mobile orifice into the outer air in front and by an equally mobile orifice into the middle portion of the throat cavity behind. The mouth cavity is bounded anteriorly by the front teeth and the lips; laterally by the side teeth and the cheeks; below by the tongue and by a membrane stretched between the tongue's under surface and the inner surface of the jaws; above by a horizontal plate of bone known as the *hard palate* and posteriorly by a movable fold of muscular tissue known as the *soft palate,* which arches backwards and downwards from the termination of the hard palate. The soft palate forms an incomplete barrier between the mouth cavity and the cavity of the throat, hanging between the two much like a fleshy curtain.

The mouth cavity, like the nasal cavity, is lined thruout with mucous membrane.

**The Pharyngeal Cavity.** The cavities of both the mouth and nose open behind into the throat, or pharyngeal cavity—a funnel-shaped passage four or five inches in length which extends from the base of the skull downwards to the opening of the larynx on one hand and to the opening of the gullet on the other. The portion of the throat into which the nasal passages open is known as the *naso-pharyngeal cavity;* the portion into which the mouth opens, the *oro-pharyngeal cavity;* and the portion into which the larynx opens, the *laryngo-pharyngeal cavity.*

Altho really a part of the alimentary canal, the throat, because of its "cross-roads" position, is one of the most important links in the chain of respiratory passages.

Like the oral and nasal cavities, it is lined with a delicate mucous membrane.

**The Laryngeal Cavity.** The throat opens at its lower front extremity into the voice-box or laryngeal cavity. This is a relatively short passage formed by a strong elastic tube continuous with the inner lining of the windpipe and surrounded by a framework of cartilages movably articulated together. It is protected from the intrusion of food or water passing thru the throat en route to the gullet by a cover cartilage known as the *epiglottis.* This clamps down tightly and securely closes the upper opening of the larynx during the act of deglutition; the food or water being swallowed is thus diverted from the respiratory passage it might otherwise enter and, sliding over the protecting surface of the epiglottis, enters the gullet at the rear.

**The Trachea.** The cavity of the larynx opens at its lower end into the windpipe, or trachea—a flexible cylindrical tube, somewhat flattened in the rear, which descends from the inferior laryngeal aperture a distance of about four or four and a half inches to a point opposite the third dorsal vertebra of the spine, where it subdivides into the two bronchi.

The trachea is held open by a series of eighteen to twenty cartilaginous rings, stationed horizontally one above the other, and is lined interiorly with an extremely delicate mucous membrane.[3] The latter is provided with a surface layer of ciliated cells, each unit of which serves as anchorage for a tuft of twenty or thirty minute, con-

[3] This mucous membrane extends upward thru the upper part of the throat into the nasal cavity and downward into the smallest bronchioles of the lungs.

stantly moving hairs. The function of these hairs, or *cilia,* is to sweep upwards by a quick lashing movement a mucous secretion derived from small glands located on the membrane surface and from larger underlying glands

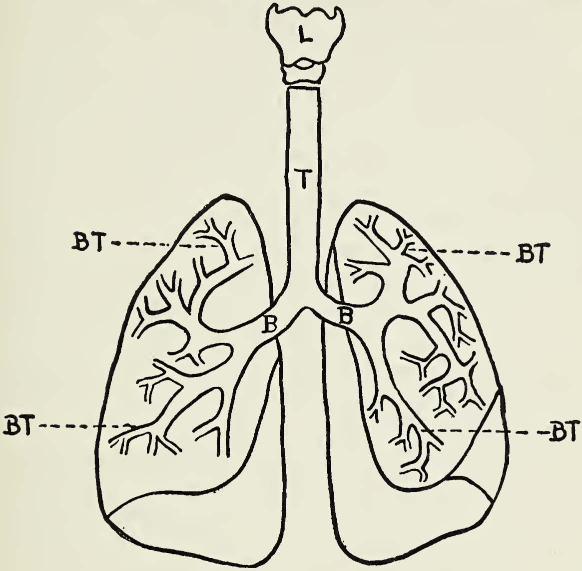



Fig. 3

Diagrammatic representation of the lower portion of the respiratory tract showing the larynx (L), trachea (T), bronchi (B) and bronchial tubes (BT).

which communicate with the membrane surface by excretory ducts. After the upward lashing movement has been completed, the cilia move gently back to a position that permits them once more to lash vigorously upwards in the direction of the throat. A steady flow of

mucous secretion is thus maintained towards the exit of the trachea—insuring the freedom of this important air passage from dust particles or other foreign matter.

**The Bronchi.** At its lower extremity the trachea divides into two smaller branches known as the bronchi, which lead directly into the lungs.

The right bronchus is wider and shorter than the left and branches off from the trachea at a slightly less obtuse angle. It contains from six to eight imperfect cartilaginous rings similar in structure to the rings of the trachea and similarly imbedded in elastic tissue. In length the right bronchus measures a little over an inch and enters the right lung at its root on a level with the fourth dorsal vertebra of the spine.

The left bronchus is narrower and longer than the right and branches off from the trachea at a more obtuse angle. It is about two inches long, contains from nine to twelve cartilages, and enters the left lung on a level with the fifth dorsal vertebra.

Both bronchi are provided with muscle fibres and are lined with a delicate mucous membrane containing a surface layer of ciliated cells. In these, and in practically all other structural features, the bronchi closely resemble the trachea.

**The Bronchial Tubes.** When the bronchi enter the lungs, they break up into a great number of smaller branches known as bronchial tubes. The right bronchus first subdivides into three fair sized tubes which enter the three lobes of the right lung, and the left bronchus into two fairly large tubes which enter the two lobes of the left lung. These five major bronchial tubes then subdivide very rapidly, branching out into the spongy

mass of the lungs in all directions and steadily diminishing in size. As they grow smaller the cartilaginous rings which characterize the structure of the trachea and bronchi and are continued in all the larger bronchial tubes, gradually disappear until the walls of the smallest bronchial tubes (*bronchioles*) are entirely muscular or membraneous. Thus while the trachea and bronchi are kept permanently open for the passage of air by cartilaginous reinforcements, the smaller bronchial tubes may be almost entirely closed by the contraction of their muscular walls. These final non-cartilaginous ramifications of the bronchial tubes terminate in elongated dilations made up of tiny sacs which open irregularly into the cavity of the dilation. The terminal dilations are known as *infundibulæ* and the tiny sacs of which they are composed as *alveoli* or air cells.

**The Physiology of Respiration.** Respiration consists of two distinct physiological processes: (1) *inspiration*—the entrance of an air current into the body, and (2) *expiration*—the exit of an air current from the body.

During inspiration the chest expands and a current of air enters the body thru either the nasal cavity or the cavity of the mouth, proceeding thence backwards and downwards thru the throat, larynx and trachea to the bronchi. The inspired air current is divided by the bronchi into two separate streams and is then further divided by the ramifying branches of the bronchial tubes until it is finally diffused into the innumerable microscopic air cells of the lungs.

During expiration the chest contracts and a current of air proceeds from the air cells of the lungs back along

the respiratory tract just described to the outer atmosphere. In the trachea the expired air current is concentrated into a single, fairly powerful stream which, after passing thru the laryngeal chamber, is radiated by the concave under-surface of the epiglottis against the rear wall of the throat and is thence directed out of the body via either the mouth or the nose.

Thus far we have concerned ourselves entirely with the anatomy of the body regions involved in the processes just described, postponing an answer to the important question—*how are inspiratory and expiratory air currents induced?*

First we must realize that air has weight. The downward pressure of the atmospheric envelope surrounding our earth is, at sea level, about 14.7 pounds to each square inch. If we remove a pair of lungs from a dead body this pressure is exerted on both the inner and outer surfaces of the lungs with equal intensity. The exposed lungs, hence, being highly elastic, shrink at once to a comparatively small size. When the lungs are in place in the human body, however, the pressure of the atmosphere is exerted on their inner surfaces only—i. e., the interior of the lungs communicates freely with the outer air thru the respiratory passages whilst the outer surfaces of the lungs are shut off from such communication and completely protected from the influence of atmospheric pressure by the rigid, air-tight walls of the thorax.

Hence the uncounterpoised atmospheric pressure inside the lungs, as we find them in the living body, overcomes their elastic tendency to shrink and blows them out until they completely fill all space in the thoracic cavity not occupied by other organs.

Now if this space is in any way added to, let us say by a flattening of the arched floor of the thoracic cavity,[4] a body of fresh air moves into the lungs in obedience to the ever present downward push of the atmosphere, until the newly created space is occupied by the further inflation of the lung mass.

If the space in the thoracic cavity is in any way lessened, let us say by a recoil of the diaphragm to its former arched position, the atmospheric pressure within the lungs momentarily becomes greater than that outside them. To equalize these pressures a body of air moves out of the lungs in quite the same manner as water is squeezed out of a sponge.

The entire mechanism of respiration thus reveals itself as an *equalizing of air pressures* dependent upon the expansions and contractions of the walls of the thoracic cavity, these expansions and contractions being dependent in turn upon the action of *respiratory muscles.*

**Expiration and Speech Production.** The sole purpose of the respiratory mechanism—as far as speech production is concerned—is to produce *an expiratory blast of air from the lungs.* Inspiration must be regarded as a function of importance to speech production only in that it serves to store the lung reservoirs with air that may be subsequently expired.

The expired air current, rather than the inspired, is utilized for speech production because it is especially adapted in a number of ways for the formation of a

[4] The space in the thoracic cavity may be added to in other ways than by the depression of the diaphragm. Thru the action of the *external intercostals* and associated inspiratory muscles, the ribs may be elevated and the thorax thus enlarged from side to side and from front to rear.

rapid succession of sounds. In the first place the expired air current is not necessarily dependent upon any muscular activity (as is the inspired air current). A current of air sufficient for all ordinary purposes of speech production may be expired by an entirely passive process. The

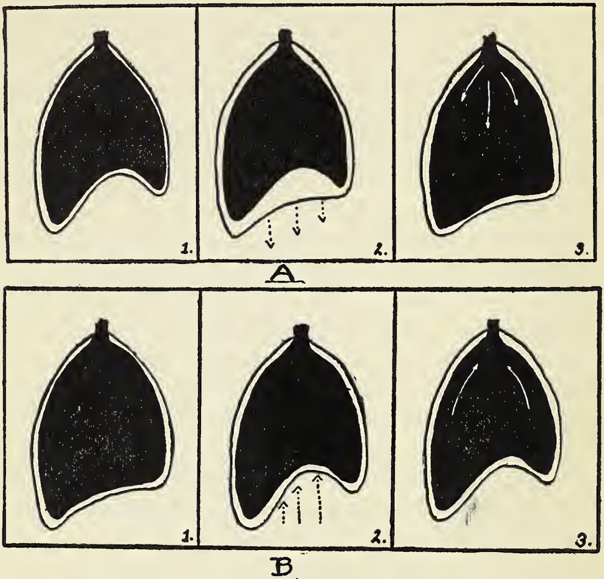



FIG. 4

(A) Schematic representation of the physiology of inspiration: (1) the external surface of the lungs in apposition with the internal surface of the thorax, (2) the convex floor of the thorax depressed, (3) the lungs expanded by an inspiratory air current induced thru atmospheric pressure and the newly created thoracic space thus filled.

(B) Schematic representation of the physiology of expiration: (1) the external surface of the lungs in apposition with the internal surface of the thorax, (2) the floor of the thorax elevated to a convex position, (3) an expiratory air current induced by forced contraction of lungs.

returning air current is thus peculiarly flexible and subject to all sorts of modifications. It can be strengthened or prolonged by means of special muscular activity. It can be expelled slowly and evenly, as in ordinary conversation, or violently, as in a shout. It can be maintained as a practically continuous stream, interrupted only by brief inspirations, which, in ordinary conversation, are hardly noticeable. For these reasons, and for others it will not be necessary for us to go into here, the expired air current, rather than the inspired, is utilized for the production of speech. The expired air current thus reveals itself as the fundamental and dynamic basis of speech—the energic origin of not only the sounds of our own language, but the sounds of all languages.

With our knowledge of the respiratory mechanism as a background, we are now in a position to investigate how the mechanism of phonation utilizes the motive energy of expired breath for the initiation of *speech tones* and how the mechanism of articulation utilizes the motive energy of expired breath for the initiation of *speech noises.*

### (2) THE MECHANISM OF PHONATION

It is the special duty of the mechanism of phonation to utilize the energy furnished by expired breath currents for the initiation [5] of speech tones.

**Speech Tones Defined.** Speech tones may be defined as musical sounds of spoken language having their

[5] The reader should note carefully that the mechanism of phonation functions merely to *initiate* speech tones. Before the latter can enter into the acoustic structure of articulate speech, they must be built up in volume and shaded in quality by the mechanism of resonation.

origin in the rapid, rhythmic vibration of elastic bodies known as the *vocal chords.* Like all musical sounds, speech tones have three fundamental properties: (1) strength (2) pitch and (3) quality.

**The Larynx.** The tones of human speech are initiated within a delicate little organ known as the *larynx* or *"voice box."* This organ is situated at the superior extremity of the trachea and comprises:

(1) The Laryngeal Tube
(2) The True and False Vocal Chords
(3) The Laryngeal Cartilages
(4) The Laryngeal Muscles

So endlessly varied are the adjustments of the larynx in the process of phonation, and so exquisitely sensitive its muscular control, that it will be necessary for us to make

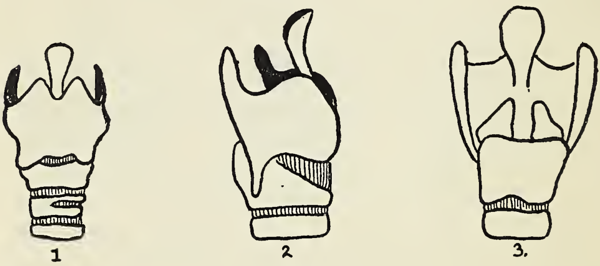



FIG. 5
The cartilaginous framework of the larynx viewed (1) from front, (2) from side and (3) from rear.

a careful study of the anatomy of the entire organ before attempting an analysis of its physiology.

**The Laryngeal Tube.** The logical starting point for

our study of larynx anatomy is the laryngeal tube. This tube is merely a thickened continuation of the inner fibro-elastic lining of the trachea which protrudes for about two inches beyond the latter organ's topmost cartilaginous ring. It is surrounded by the cartilages of the larynx and is coated interiorly with a thin, tightly adherent mucous membrane. Altho not especially unique in structure the laryngeal tube is, as we shall see presently, the foundation of the vocal apparatus of the larynx.

**The True and False Vocal Chords.** The true vocal chords (so named because they are the "sounding bodies" of the larynx) are, accurately speaking, not chords at all but the free upper edges of two folds of elastic tissue which approach each other from opposite lateral walls of the laryngeal tube. The front extremities of these folds, or chords, meet in a common attachment with the inner surface of what is known as the *thyroid cartilage.* From this front attachment the two chords separate, extending horizontally and to the rear across the cavity of the larynx for a distance that measures in the average male adult about seven-twelfths of an inch—in the average female adult, about five-twelfths of an inch. In the rear of the larynx the hinder extremities of the chords are attached to the lower front processes of two other cartilages known as the *arytenoids.*

Between the vocal chords there occurs a narrow fissure known as the *glottis,* the shape of which serves as an accurate indication of whether or not the larynx is adjusted for the initiation of speech tones. If the glottis appears wide and triangular, the larynx is adjusted for quiet

breathing; if the glottis appears narrow and elliptical, its edges almost touching, the larynx is adjusted for phonation.


Fig. 6

Laryngoscopic images of the human larynx, showing vocal chords adjusted for (1) quiet breathing and (2) initiation of speech tones. (The *laryngoscope* is a mirror used by surgeons for the inspection of the larynx. This instrument, when properly inserted into the oral cavity, reflects the upper external surfaces of the vocal chords.)

The mucous membrane lining the interior of the laryngeal tube does not cover the thin, vibrating edges of the vocal chords. These edges are made up of uncovered elastic tissue mixed with fibres running lengthwise and appear to the eye, when viewed thru the laryngoscope, of a delicate, pearly white color. They are the sounding bodies [6] of the larynx and are hence indispensable factors in the mechanism of phonation;—indeed, we may consider every other part of the laryngeal structure as existing only for their manipulation and protection.

The so-called false vocal chords (properly the *ventricular bands*) have nothing to do with the production of tone, functioning only to protect the true chords. They are located about two-fifths of an inch above the latter

[6] There are only two substances in the speech mechanism which are elastic enough to act as sounding bodies—(1) the true vocal chords and (2) air. The part played by vibrating *air blades* in the production of speech noises will be discussed later.

and constitute the lower edges of two membraneous folds which mark the upper entrance to the larynx. The origin of these folds from the elastic walls of the laryngeal tube and their relation to the underlying folds of the true vocal chords may best be understood by reference to the accompanying diagram.

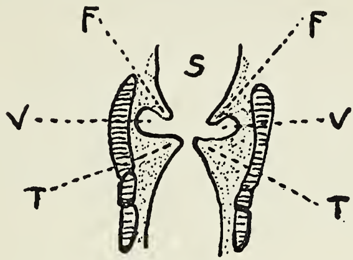



FIG. 7
(*Adapted from Meyer's* "Organs of Speech")
Diagrammatic vertical cross section of the larynx, showing the true vocal chords (T–T), the false vocal chords (F–F), the intervening *ventricles of Morgagni* (V–V) and the overlying *sacculis laryngis* (S).

Between the false vocal chords and the true vocal chords occur two shallow depressions known as the "pockets" of the larynx or the *ventricles of Morgagni.* These give the true vocal chords room for adjustment during vibration and act as resonance chambers (see page 31).

Above the false vocal chords the laryngeal tube widens out into a conical shaped passage known as the *sacculis laryngis* or laryngeal "vestibule." This passage, while structurally part of the larynx, may be conveniently considered as a neutral space separating the actual vocal apparatus from the overlying pharyngeal cavity. The inner

mucous surface of the sacculis laryngis is liberally provided with follicular glands which discharge a secretion for the lubrication of the vocal chords.

**The Laryngeal Cartilages.** The cartilages of the larynx furnish points of attachment for the true and false vocal chords and protectively enclose the entire laryngeal tube. They are nine in number (three single and three pairs) and comprise:

(1) The Cricoid Cartilage (single)
(2) The Thyroid Cartilage (single)
(3) The Arytenoid Cartilages (paired)
(4) The Cornicular Cartilages (paired)
(5) The Cuneiform Cartilages (paired)
(6) The Epiglottis (single)

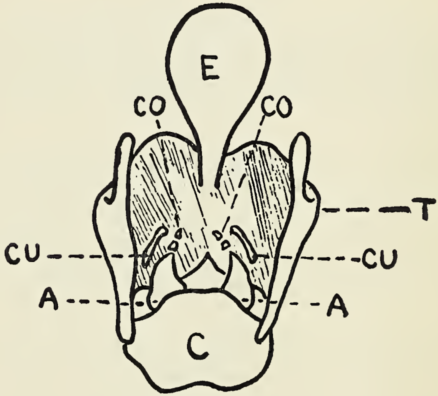



Fig. 8

Diagrammatic analysis of the cartilages of the larynx, showing: (E) epiglottis, (T) thyroid cartilage, (CO–CO) cornicular cartilages, (CU–CU) cuneiform cartilages, (A–A) arytenoid cartilages and (C) cricoid cartilage.

The laryngeal cartilages are movably articulated together and are hence capable of endless changes in relative position.

**The Laryngeal Muscles.** To each of the nine cartilages of the larynx is attached a number of delicate, exquisitely sensitive muscles. About half of these muscles run from the outer cartilage surfaces to adjacent bones such as the hyoid or sternum; the rest connect one laryngeal cartilage to another.

The muscles which run from the outer cartilage surfaces to adjacent portions of the body frame serve merely to elevate or depress the larynx as a whole and to steady it during phonation. They are essentially extrinsic in character, have little or nothing to do with the finer laryngeal movements necessary for the production of tone, and need not concern us here.

Our interest naturally centers upon the muscles which connect the different cartilages with each other, the so-called intrinsic muscles of the larynx, since these control by their activity the position and tension of the true vocal chords. They include:

(1) The Transverse Arytenoid
(2) The Posterior Crico-arytenoid
(3) The Lateral Crico-arytenoid
(4) The Thyro-arytenoid
(5) The Crico-thyroid

**Laryngeal Physiology.** An investigation of the intrinsic muscles of the larynx brings us at once into contact with the problems of laryngeal physiology. How are the vocal chords adjusted for phonation? In what way is phonation effected? How are the pitch, strength, and quality of speech tones determined?

*Adjustment of the Vocal Chords for Phonation.* For phonation the vocal chords must be slightly tensed and so approximated that the utmost width of the fissure between them will not exceed two millimeters (one twelfth of an inch). This latter adjustment is effected by the

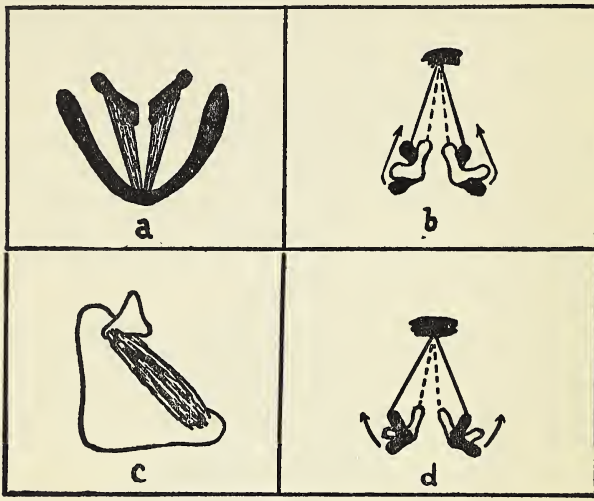



Fig. 9

(*Adapted from Meyer's* "Organs of Speech")

(a) The thyro-arytenoid muscle viewed from above. (b) Diagrammatic cross section of glottis showing direction of pull exerted by the thyro-arytenoid muscle and its effect upon the position of the vocal chords. (c) Side view of the larynx with one shield of the thyroid cartilage broken away to show the lateral crico-arytenoid muscle. (d) Diagrammatic cross section of the glottis, showing direction of pull exerted by the lateral crico-arytenoid muscle and its effect upon the position of the vocal chords.

combined action of two of the intrinsic muscles of the larynx—the *lateral crico-arytenoid* and the *thyro-arytenoid.*

When the vocal chords have been approximated by the muscular action just described, air is blown against them from below in the form of an expiratory breath current. The chords, being elastic, are forced upwards and apart—thus permitting a puff of air to escape, which slightly diminishes the pressure from below. In response to the diminution in pressure from below the chords recoil to their former position and renew their resistance to the expiratory blast. Again they yield exit to a puff of air and again they recoil. The regular, rapid repetition of this process of alternate yielding and recoil throws the vocal chords into a state of steady vibration, in consequence of which "waves" are set up in the air surrounding the chords. These waves are then brought to a focus by the mechanism of resonance, discharged from the speech mechanism to be picked up by the ears of listeners, converted into nervous impulses and interpreted as voice.

*Strength, Pitch and Quality.* We have noted previously that speech tones possess the three fundamental properties common to all musical sounds—strength, pitch and quality.

In considering these three properties it is necessary to remember that the mechanism of phonation accounts merely for the *initiation* of speech tones—not for their complete development. Before speech tones can enter into the acoustic structure of spoken language they must be built up in volume and shaded in quality by the mechanism of resonation. This means that two factors, rather than one, determine the properties of speech tones —viz.:

(1) adjustments of the mechanism of phonation
(2) adjustments of the mechanism of resonation

For the present we must confine ourselves to an investigation of the first of these factors.

(1) Strength.—The first determinant of the strength of a speech tone is the *vibratory amplitude* of the vocal chords—i. e., the width of the swing each vocal chord is made to take during vibration to either side of its neutral position of rest. The relationship involved in this determination may be expressed as follows:

*The more ample the vibration of the vocal chords, the louder the speech tone they initiate. The less ample the vibration of the vocal chords, the weaker the speech tone they initiate.*

Since the vibratory amplitude of the vocal chords depends in turn upon the strength of the expiratory breath current which strikes them during phonation, the above formula may be restated as follows:

*The more vigorous the expiratory breath current which strikes the vocal chords when adjusted for phonation, the more ample will be their vibration and hence the louder the speech tone they will initiate. The feebler the expiratory breath current which strikes the vocal chords when adjusted for phonation, the less ample will be their vibration and hence the weaker the speech tone they initiate.*

The strength of a speech tone is affected also by resonance—a matter, however, we cannot discuss at this point.[7]

(2) Pitch.—It is generally agreed by physicists that the pitch of a speech tone depends entirely upon the

[7] It may be noted in passing that the effect of resonance upon the strength of a speech tone, while vitally important, is quite constant —i. e., it is not subject to voluntary modulation.

*vibratory frequency* of the vocal chords [8]—i. e., upon the number of swings per unit of time each vocal chord is made to take during vibration to either side of its neutral position of rest. This relationship we may express in the following formula:

*The more rapidly the vocal chords are made to vibrate, the higher on the scale will be the speech tone they initiate. The more slowly the vocal chords are made to vibrate, the lower on the scale will be the speech tone they initiate.*

The vibratory frequency of the vocal chords depends in turn upon their TENSION, as determined by the adjustments of the crico-thyroid and thyro-arytenoid muscles.

The crico-thyroid muscle comprises two triangular bands of fibre which arise from the front lateral portions of the cricoid cartilage and pass obliquely upwards and outwards to be inserted into the lower borders of the shields of the thyroid cartilage and the front borders of the inferior thyroid cornua. These bands act to rotate the thyroid cartilage upon its articulations with the cricoid in such a manner that the former is drawn forward and downward. The result of this action, as shown in Fig. 10 on the next page, is to lower and tense the vocal chords.

The thyro-arytenoid muscle, already mentioned as an approximator of the vocal chords, is the antagonist of the crico-thyroid muscle. When this muscle contracts, it rotates the thyroid cartilage upward and inward—thus raising and relaxing the vocal chords.

The relationship between the pitch of a speech tone and

[8] This point is disputed, some authorities contending that resonance partially determines the pitch of a speech tone.

the tensity or laxness of the vocal chords as determined by the adjustments of the muscles just described may be expressed in a second formula:

*The more the vocal chords are tensed during phonation, the more rapidly they will vibrate and hence the higher will be the pitch of the speech tone they initiate. The less the vocal chords are tensed during phonation, the more slowly they will vibrate and hence the lower will be the pitch of the speech tone they initiate.*

(3) Quality.—By the quality of a speech tone we mean its "color" or "timbre"—that property of the

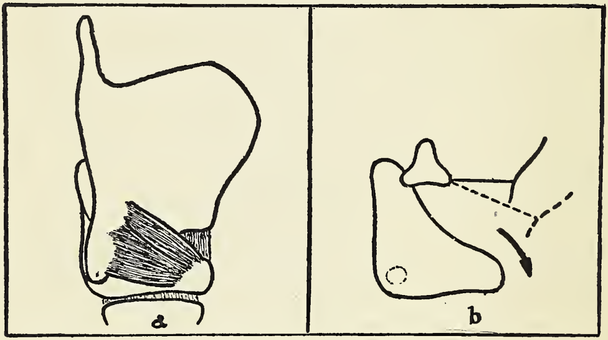



FIG. 10
(*Adapted from Laurens'* "Oto-Rhino-Laryngology")
(a) Side view of the larynx, showing right half of the crico-thyroid muscle. (b) Diagrammatic vertical cross section of the larynx, showing direction of pull exerted by the crico-thyroid muscle upon the thyroid cartilage and the effect of this pull upon the position and tension of the vocal chords.

English speech tone A *as in* STAR, for example, which enables us at once to distinguish it from the English

speech tone A *as in* FLAT, even tho the latter have the same strength and pitch as the former.

To properly analyze the determinants of tone quality we must employ the terminology of the musician and speak of *partials, fundamentals* and *overtones.* These terms all refer to the capacity of the vocal chords (and of practically all musical vibrators as well) to vibrate both as wholes and in certain definite segments—i. e., in halves, thirds, fourths, fifths, sixths, etc.

During phonation these segments vibrate quite independently of each other, have different frequencies and amplitudes, and initiate independent tones of varying pitch and strength. Hence what we really hear when the vocal chords vibrate is not a simple but a COMPOUND tone, a tone which represents the fusion of a whole series of what musicians appropriately term *partials.*

According to musical terminology the lowest and most dominant of the partials in a given speech tone is known as the *fundamental.*[9] This arises from the vibration of the vocal chords as wholes. The lighter partial just above the fundamental in pitch, arising from the vibration of the vocal chords in halves, is known as the *first overtone;* the still higher partial arising from the vibration of the vocal chords in thirds is known as the *second overtone;* etc.

Adopting this terminology we may consider the quality of a given speech tone as dependent upon:

(1) The Number of its Partials

[9] It is to the pitch of the fundamental that we refer when we speak of *the* pitch of a musical note.

(2) The Pitches of its Partials

(3) The Relative Strengths of its Partials

The first two of the three factors above listed are constant inasmuch as they depend almost entirely upon innate and fixed anatomic peculiarities of the vocal chords—i. e., their general composition, shape, elasticity, manner of attachment, etc.

The last factor is variable—endlessly so—being subject to an exquisitely delicate and flexible control by the mechanism of resonation. The nature of the relationship of the resonance conditions of the speech mechanism with the relative strengths of the partials of speech tones (and thus, indirectly, with the qualities of speech tones) we shall discuss in the succeeding section.

### (3) THE MECHANISM OF RESONATION

We have seen in the last section how the mechanism of phonation utilizes the motive energy of expired breath to initiate speech tones. We have now to consider how speech tones, following their initiation in the larynx, are amplified in volume and developed in quality by the mechanism of resonation.[10]

**Air Waves.** To understand the various phenomena of resonance it is necessary to investigate the nature and

[10] Before they are resonated, speech tones are woefully weak and flat. To appreciate the acoustic contrast between speech tones before and after resonation, the reader is urged to conduct the following simple experiment:

> *Play a musical record on an old fashioned "horn" phonograph, with the horn removed. Replace the horn and play the record again.*

The acoustic contrast between the results of the first and second playing of the record will be closely analogous to the acoustic contrast between speech tones before and after resonation.

origin of *air waves.* Air waves may be defined as the agents of communication between a sounding body and the tympanic membrane of the human ear, their function being to beat steadily against the latter in such a manner as to throw it into sympathetic vibration with the former. They thus provoke nervous impulses which proceed along certain well defined neural paths to the auditory center of the brain, there to be perceived and subjectively appreciated as sound.

**Phases of Condensation and Rarefication.** The origin of an air wave is relatively simple.

When a sounding body, let us say a vocal chord, swings to one side of its neutral position of rest, it pushes the particles of air [11] immediately before it closer together. As soon as the particles next to the chords are affected in this way, they crowd against their neighbors—which in turn crowd against other particles—and so on, an impulse of pressure in this way being passed from one series of particles to another in all directions away from the chord. There is thus produced what is known as a *phase* of *condensation.*

When the vocal chord has swung as far as it can to one side of its neutral position of rest, producing a phase of condensation as above described, it immediately swings back in the opposite direction—leaving the air particles in its wake relatively rarefied, i. e., widely separated. There is thus produced what is known as a *phase* of *rarefication.*

Again the vocal chord "attacks," starting another phase

[11] The air is composed of infinitesimally small units known as *molecules.* These number, according to scientific estimates, approximately a million billion to each cubic centimeter of air.

of condensation, and again it recoils, the action and reaction of pressure and release being continued in very rapid succession.

Each phase of condensation together with its corre-

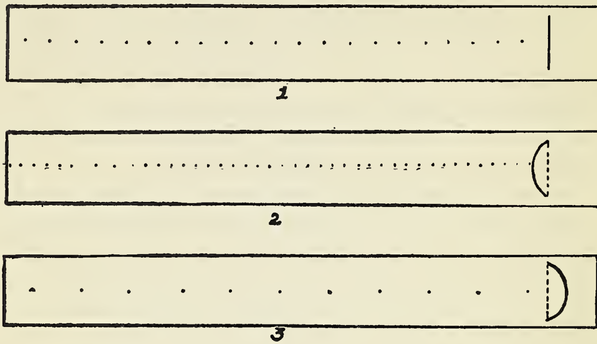


FIG. 11

Schematic representation of a vocal chord (1) in a neutral position of rest, showing normally spaced air particles immediately adjoining, (2) swung to left of its neutral position of rest, showing air particles in front of it crowded together in a *phase of condensation* and (3) swung to right of its neutral position of rest, showing air particles behind it widely separated in a *phase of rarefication.*

sponding phase of rarefication is considered to constitute one complete AIR WAVE.

**Resonance Defined.** Resonance [12] may be defined as the reflection of the phases of condensation of a great many air waves in such a manner that they are brought to a focus (i. e., concentrated) near, and within, the re-

[12] The authors are indebted to the researches of Dr. F. S. Muckey for final clarification of the concept of resonance as involved in human speech.

stricted outlet of a cavity.[13] The results of resonance are:

(1) a great amplification of the resonated sound
(2) a definite shading of the quality of the resonated sound

**Resonance in Speech.** In the human body the cavities of the throat, mouth and nose, together with the laryngeal ventricles, the sacculis laryngis, and the maxillary, sphenoidal and ethnoidal sinuses, serve to resonate the speech tones initiated by the mechanism of phonation.

The phases of condensation of the air waves set up by the vocal chords are reflected at different angles from the walls of these cavities in such a manner that they are all brought together just within the restricted exit of the mouth cavity, or, if the mouth passage is closed and the soft palate lowered, just within the restricted exit of the nasal cavity. Thru the restricted exit of the mouth—or nose—the concentrated phases of condensation are then discharged as one greatly amplified impulse.

In this way the weak, practically inaudible speech tones initiated in the larynx by the mechanism of phonation are so built up in volume that they are able to enter directly into the acoustic structure of articulate speech.

**Speech Resonance and Quality.** If we do not forget that every speech tone is compound in structure, hence divisible into a series of *partials,* the question now naturally arises: *Do the resonators of the human body reinforce with equal strength all the partials of a given speech tone?*

To this question a most emphatic negative answer must be given. In obedience to certain acoustic laws which

[13] A cavity which resonates sound is known as a *resonator.*

it will not be necessary for us to go into here, the resonators of the human body never reinforce more than a few of the partials of a given speech tone—and those few with widely varying intensities. What is more important, one of the speech resonators, viz. *the oral cavity,* is so constructed that both its size and shape may be varied almost indefinitely by voluntary muscular action—thus making possible the selection for reinforcement of first one and then another set of partial tones. This means that the resonance mechanism of human speech provides for endless shades of voice quality—since one of the important factors determining the quality of a speech tone is, as we have already noted,[14] the *relative strengths of its partials.*

Thus when the oral resonance chamber is shaped as indicated in the left of the two figures on the accompanying diagram, one particular set of partial tones will be strengthened, and consequently a speech tone of a certain

FIG. 12

definite and peculiar quality will be produced—in this instance the English vowel E *as in* WEAL. Similarly, when the oral resonance chamber is shaped as indicated

[14] See page 28.

in the right of the two figures on the accompanying diagram, another particular set of partial tones will be strengthened and a speech tone of a different quality will be produced, this time the English vowel OO *as in* BOOT.

In short, one of the most important functions of the mechanism of resonation is the determination of the acoustic characters—i. e., the *qualities* of speech tones. Were it not for the mechanism of resonation all speech tones would sound very much alike—flat, colorless, non-distinctive and "uninteresting."

### (4) THE MECHANISM OF ARTICULATION

We have noted in the last two sections how the mechanisms of phonation and resonation function to produce *speech tones.* We have now to consider how the mechanism of articulation utilizes the motive energy of expired breath for the production of *speech noises.*

**Speech Noises Defined.** Speech noises may be defined as non-musical sounds of spoken language having their origin in the irregular, unrhythmic vibration of relatively rigid sheets of air known as *air blades.* They are sharply differentiated from speech tones in that the latter are musical sounds of spoken language having their origin in the regular, rhythmic vibration of the vocal chords.

With but one exception that will be mentioned in the next chapter [15] all the noises of human speech arise in the cavity of the mouth in response to adjustments of the following organs:

[15] See page 45.

(1) The Lips
(2) The Teeth
(3) The Gums
(4) The Hard Palate
(5) The Soft Palate
(6) The Tongue

**The Lips.** The lips are two transverse fleshy folds which are continuous externally with the integument of the face, and internally with the mucous membrane of the oral cavity.

When at rest the lips press gently against each other, closing the front orifice of the mouth. When in a state of muscular activity they perform an endless number of voluntary movements—separating, pressing more closely together, widening, pursing, thrusting forward, drawing back tightly against the teeth, tensing, laxing, etc.

As a result of these movements [16] a current of expired breath may be constricted or temporarily interrupted just before it leaves the body, thus giving rise to a number of important speech noises,—e. g., WH *as in* WHERE, P *as in* POND.

**The Teeth.** Firmly rooted in sockets hollowed out by nature in the semicircular borders (*alveolar processes*) of the upper and lower jaw bones, occur the wonderful little structures that we know as teeth.

In the normal adult the teeth number in all 32, 16 to each jaw.[17] These may be divided according to their

[16] Lip movements also, it will be pointed out later, alter materially the size and shape of the mouth as a resonator, thus influencing the quality of speech tones.

[17] This is true of the permanent teeth only. The so-called milk teeth of childhood, which are ultimately loosened and replaced, num-

structural adaptation for special uses into the following

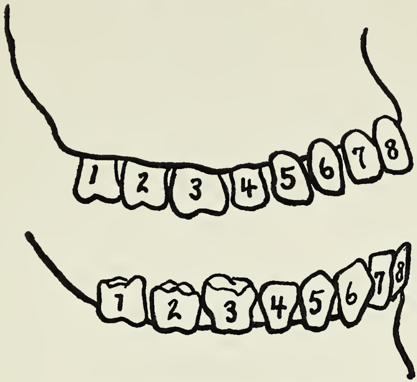



FIG. 13

Diagrammatic representation of the right halves of the upper and lower dentition of an adult showing incisors (7–8), canines (6), bi-cuspids (4–5) and molars (1–2–3).

four groups:

(1) The Incisors
(2) The Canines
(3) The Bi-cuspids
(4) The Molars

ber but 20, 10 to each jaw. The following comparative chart indicates the ages at which the temporary and permanent teeth appear:

| TEMPORARY DENTITION | |
|---|---|
| Central incisors | 5½– 7 months |
| Lateral incisors | 7–10 months |
| First molars | 12–14 months |
| Canines | 14–20 months |
| Second molars | 18–36 months |

| PERMANENT DENTITION | |
|---|---|
| First molars | 6th year |
| Central incisors | 7th year |
| Lateral incisors | 8th year |
| First premolars | 9th year |
| Second premolars | 10th year |
| Canines | 11–12th year |
| Second molars | 12–13th year |
| Third molars or wisdom teeth | 17–21st year |

It will not be necessary for us to consider the teeth in anatomic detail since the part they play in articulation is relatively simple. Thus, during the production of the speech noise F *as in* FINE the lower lip is raised into contact with the edges of the four upper incisors and two upper canines. Expired breath is then "squeezed" between the interproximal spaces of the teeth mentioned, with the result that a certain peculiar and characteristic hissing noise is produced. Similarly, in the production of the speech noise TH *as in* THIN the edges of the tongue are raised into contact with practically all the upper teeth (with the possible exception of the last two molars on either side of the jaw) and a current of expired breath is then squeezed between the interproximal spaces of the canines and incisors. Another peculiar and characteristic speech noise is thus produced.

We may infer from the previous illustrations, which are quite representative, two things: first, that only the upper front teeth enter importantly into articulatory contacts, and second, that these upper teeth play a purely passive part in such contacts, performing no movements of their own. The upper teeth are rooted, be it remembered, in the semicircular border, or alveolar process, of the upper jaw—which is immovably joined with the main body of the skull.

**The Gums.** All thirty-two teeth described in the previous section are embraced at their necks by "gums" —coatings of dense, fibrous tissue which adhere tightly to the alveolar processes of the jaws. The upper gums play about the same role in articulation as the upper teeth—furnishing stationary points of contact for a mobile body. In the production of the speech noise T

*as in* TOWN, for example, the tongue moves up into complete occlusion with the upper gums and thus temporarily interrupts the current of expired breath. The subsequent release of this current attendant upon the dropping of the tongue results in the production of a characteristic explosive noise. In a somewhat similar manner the speech noise S *as in* SINK may be produced by squeezing a current of expired breath between the grooved blade of the tongue and the front upper gums.

**The Hard Palate.** The hard palate, which forms the entire front portion of the roof of the mouth, consists of a horizontal plate of bone bounded in front and on

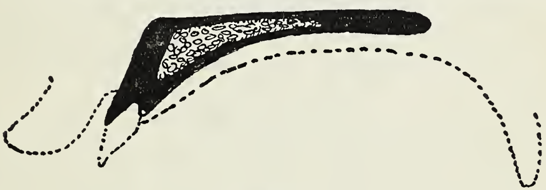


FIG. 14

Diagrammatic vertical cross section of the hard palate, showing its relationship in position to the soft palate, the upper lip and the upper teeth.

the sides by the alveolar arch of the upper jaw and the gums,[18] and in the rear by the pendulous fold of the soft palate.[19]

Several important speech noises which we shall

[18] The division between the gums and hard palate is marked by the point where the roof of the mouth ceases to be convex to the tongue and begins to be concave.

[19] The boundary between the hard and soft palate may be determined by pressing a finger against the roof of the mouth just behind the front incisors and then sliding it back until the tissue of the mouth roof is felt to yield. The point of this yielding marks the beginning of the soft palate and the termination of the hard palate.

analyze in detail later are produced when an expired breath stream is squeezed between the hard palate and the arched front of the tongue.

**The Soft Palate.** The hinder part of the mouth roof is formed by the soft palate—a movable fold of mucous membrane which arches backwards and downwards from the rear border of the hard palate. This fold terminates medially in a small, conical-shaped pendulous process known as the *uvula,* whilst its sides continue downward into the throat as the *anterior* and *posterior pillars of the fauces.*

The anterior pillars of the fauces consist of two membrane-covered ridges of muscle fibre which extend, one from either side of the base of the uvula, downwards, outwards and *forwards* to the sides of the base of the tongue.

The posterior pillars of the fauces consist of two membrane covered ridges of muscle fibre which have the same origin as the anterior pillars and extend downwards, outwards and *backwards* to the sides of the throat.

In the triangular space between the anterior and the posterior pillars of the fauces—the *isthmus of the fauces* —are located the *faucial tonsils,* two rounded glandular bodies about the size of a hazel nut.

Five relatively powerful muscles are located on either side of the soft palate proper:

(1) The Levator Palati
(2) The Tensor Palati
(3) The Palato Glossus
(4) The Palato Pharyngeus
(5) The Azygos Uvulæ

These muscles enable the soft palate to perform a variety

of movements of importance to both resonance and articulation. As an organ of articulation the soft palate

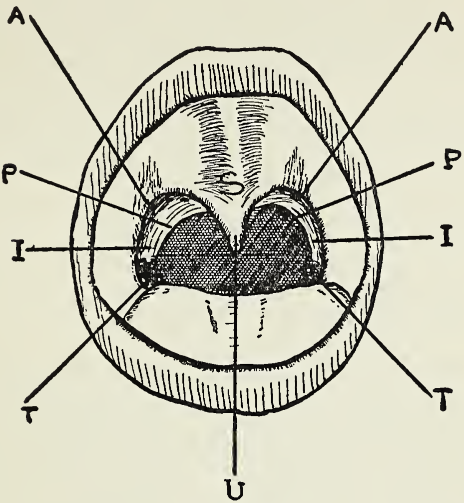



FIG. 15
The soft palate (S) viewed thru the anterior oral orifice, showing the uvula (U), the anterior pillars of the fauces (A–A), the posterior pillars of the fauces (P–P), the isthmus of the fauces (I–I), and the faucial tonsils (T–T).

cooperates with the rear part of the tongue in the production of the English speech noise K *as in* KATE.

**The Tongue.** Nearly all of the floor of the mouth is occupied by the tongue—an elongated mass of muscular tissue capable of endless variations in position and shape.

The narrow front extremity of this mass we may conveniently term the *tip of the tongue;* the portion opposite the upper front gums (including the tip), the *blade of*

*the tongue;* the portion opposite the soft palate, *the back of the tongue;* and the remaining portion, in the extreme rear, the *root of the tongue.* The entire upper surface of the tongue from tip to root, its sides, and the under surface of its blade is free; the rest is implanted firmly in the tissue of the lower jaw.

Movements of the free portions of the tongue are effected by the following muscles:

(1) The Genio Hyo Glossi (Extrinsic)
(2) The Hyo Glossus (Extrinsic)
(3) The Stylo Glossus (Extrinsic)
(4) The Lingualis Longitudinalis Superior (Intrinsic)
(5) The Lingualis Longitudinalis Inferior (Intrinsic)
(6) The Lingualis Transversus (Intrinsic)

These muscles render the tongue surprisingly mobile and hence able to participate in a great number of articulatory contacts. Speech noises, several of which we have already noted, are produced by modification of an expired breath stream with the tip of the tongue and the teeth, the blade of the tongue and the gums, the front of the tongue and the hard palate, and the back of the tongue and the soft palate.

Besides aiding in the production of speech noises, the tongue shapes the mouth cavity as a resonator—playing in this connection a most important part in determining the vowel character of speech tones.

**Air Blades.** It must not be inferred from the previous discussion that any of the tissues of the articulatory mechanism are thrown into vibration for the production of a speech noise. On the contrary, experiments have

proved that the vocal chords are the only tissues of the human body that possess sufficient elasticity to act as sound vibrators.

What then is the physical basis of a speech noise? To answer this question we must examine the nature and origin of *air blades.*

When expired breath currents are constricted at various points in the mouth cavity as the result of articulatory adjustments, there are formed immediately in front of the points of constriction dense, relatively rigid sheets of air. These sheets, or air blades, as they are called, correspond in the articulatory mechanism to the vocal chords in the mechanism of phonation. Altho indefinite in shape and without fixed attachments, air blades are capable of ample, sustained vibration and hence are able to set up vigorous sound waves in the surrounding air.

As air blades are of necessity constantly changing in shape, vibratory frequency and vibratory segmentation, however, these waves do not follow each other rhythmically or at definite intervals. They therefore give rise to noises rather than tones.

**Pitch, Strength and Quality of Speech Noises.** The strength of a speech noise depends, like the strength of a speech tone, upon the force of the expiratory breath current involved in its production. The more forceful this expiratory breath current, the ampler the air blade vibration and hence the louder the speech noise; the weaker the expiratory breath current, the less ample the air blade vibration and hence the fainter the speech noise.

Both the pitch and the quality of a speech noise are determined primarily by resonance, i. e., by the configuration of the oral cavity.

# CHAPTER II

## *THE SOUNDS OF SPEECH*

It has been emphasized that the worker in the field of speech correction must be both an anatomist and a physiologist. True! But he must be more than that. He must be above all a phonetician. His ear must be trained to appreciate the exact acoustic shadings of all the different sound units of English speech. He must understand how these sound units are linked to one another to produce *syllables* and how syllables are linked to one another to produce *breath-groups.* He must understand the principles of *stress, quantity* and *intonation.* In short, he must be thoroughly familiar with all the acoustic standards of English speech.[1]

If he is not familiar with these standards he is equipped neither to detect nor to correct speech defects since the latter represent but deviations from the standards. Ignorance of the standard must imply ignorance of the deviation.

Without further ado let us therefore proceed to an analysis of the acoustic standards of English speech as established by the current usage of the majority of cultured, traveled citizens of the United States.

[1] The phrase "acoustic standards of English speech" requires very liberal interpretation since such standards inevitably and incessantly change. Moderate differences in pronunciation between people of one part of a country and people of another part and between the younger and older generations must be expected.

**Classification of English Speech Sounds.** The sound units of English speech number forty in all. Twenty-one of these may be classified as *consonants,* fifteen as *vowels,* three as *nasal resonants* and one as a *glottal aspirate.*

*Table of English Speech Sounds*

| CONSONANTS | | | VOWELS | | |
|---|---|---|---|---|---|
| 1. WH | *as in* | WHAT | 1. E | *as in* | WEAL |
| 2. W | *as in* | WATT | 2. I | *as in* | WILL |
| 3. P | *as in* | POND | 3. A | *as in* | LACE |
| 4. B | *as in* | BOND | 4. E | *as in* | LESS |
| 5. F | *as in* | FINE | 5. A | *as in* | BARE |
| 6. V | *as in* | VINE | 6. A | *as in* | FLAT |
| 7. T | *as in* | TOWN | 7. OO | *as in* | BOOT |
| 8. D | *as in* | DOWN | 8. OO | *as in* | BOOK |
| 9. TH | *as in* | THIN | 9. O | *as in* | NOTE |
| 10. TH | *as in* | THEN | 10. U | *as in* | STUB |
| 11. S | *as in* | SINK | 11. A | *as in* | FLAW |
| 12. Z | *as in* | ZINC | 12. A | *as in* | STAR |
| 13. SH | *as in* | ASSURE | 13. O | *as in* | STOP |
| 14. ZH | *as in* | AZURE | 14. I | *as in* | BIRD |
| 15. CH | *as in* | CHOKE | 15. A | *as in* | AMID |
| 16. J | *as in* | JOKE | NASAL RESONANTS | | |
| 17. L | *as in* | LORE | 1. M | *as in* | RUM |
| 18. R | *as in* | ROAR | 2. N | *as in* | RUN |
| 19. Y | *as in* | YOUR | 3. NG | *as in* | SUNG |
| 20. K | *as in* | KATE | GLOTTAL ASPIRATE | | |
| 21. G | *as in* | GATE | 1. H | *as in* | HAND |

Those sound units which are classified on the preceding chart as *consonants* form a distinct and independent phonetic group for the following reasons:

(1) They are all relatively non-sonorous.

(2) They all consist of noise—either of noise

alone or of a substantial component of noise mixed with tone.

(3) They all require for their production that an expired breath current be interrupted or constricted in the cavity of the mouth in such a manner that a vigorously vibrating air blade is formed. (The vibration of this air blade may or may not be supplemented by the vibration of the vocal chords.)

Those sounds which are classified on the preceding chart as *vowels* form a distinct and independent phonetic group for the following reasons:

(1) They are all relatively sonorous.

(2) They all consist of tone unmixed with noise.

(3) They all require for their production that an expired breath current throw the vocal chords into vibration and that this current be then permitted to pass from the body via the mouth cavity without constriction or interruption—i. e., without the formation of air blades.

Those sound units which are classified on the preceding chart as *nasal resonants* resemble consonants in that they are relatively non-sonorous; vowels, in that they consist of tone unmixed with noise. They form a distinct and independent phonetic group for the following reasons:

(1) They all require for their production that the oral exit of the respiratory tract be completely closed.

(2) They all require for their production that the soft palate be lowered from its usual position of occlusion against the pharyngeal wall.

(3) They all require for their production that an expired breath stream pass from the body via the nasal cavity.

The sound unit classified in the preceding chart as a *glottal aspirate* (viz., H as in HAND) consists entirely of noise, is relatively non-sonorous and differs from every other sound of standard English in that it is produced in the larynx on the basis of air blade vibration. For the utterance of this sound the glottis is narrowed sufficiently

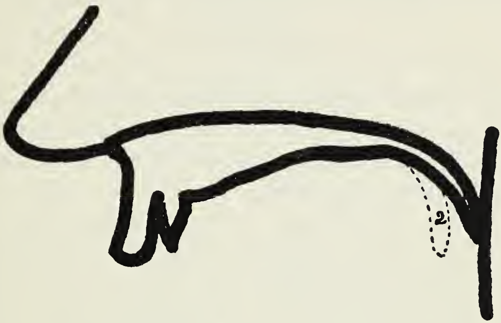


Fig. 16

Cross section of oral and nasal cavities, showing (1) soft palate in its usual position of occlusion against the pharyngeal wall and (2) soft palate lowered from this position for production of nasal resonants.

to cause audible friction (i. e., to initiate the development of an air blade just above the glottal stricture) and yet not quite enough to result in the vibration of the vocal chords.

**Written Notation of Sound Units.** We must note before proceeding further that the sound units of spoken English do not coincide with the letter units of written English. Thus, in writing the words—

BAR

BARE

BAT
BALK
BAKE
AMID

we employ but the single letter A to represent six different speech sounds, while in writing the words—

SLEIGH
SLAY

we employ six different letters to represent a single speech sound. On the one hand we have not enough letters to "go around" and on the other hand, due to the eccentricities of English spelling, we are confused by a superabundance of letters.

For the convenience and clearness of the present discussion, therefore, all sound units of spoken English will be designated as indicated on the chart—i. e., by reference to familiar key words [2] (A *as in* FLAT, E *as in* LESS, U *as in* STUB, etc.). In this way all speech sounds will be identified accurately and the use of artificial digraphs, phonetic symbols or diacritical marks avoided.

**Classification of Consonant Speech Sounds.** Consonants may be classified in three ways:

(1) *Acoustically*—according to whether they consist of noise alone or of noise plus tone

(2) *Physiologically*—according to the exact manner of their articulation

[2] Identification by this means depends, of course, upon the accuracy of the reader's auditory conception of the key words specified. Reading of this or of any other text dealing with phonetics, hence, must be undertaken cojointly with a careful study of the pronunciation of cultured speakers whom the reader has the opportunity of hearing.

(3) *Anatomically*—according to the organs which articulate them

1. *Acoustic Consonant Classification.* Consonants which consist of noise mixed with tone may be conveniently designated as *TONIC* (Greek = with tone).

Consonants which consist of noise unmixed with tone may be conveniently designated as *ATONIC* (Greek = without tone).

*Consonant Classification Chart No. 1*

| ATONIC CONSONANTS | | | TONIC CONSONANTS | | |
|---|---|---|---|---|---|
| WH | *as in* | WHAT | W | *as in* | WATT |
| P | *as in* | POND | B | *as in* | BOND |
| F | *as in* | FINE | V | *as in* | VINE |
| T | *as in* | TOWN | D | *as in* | DOWN |
| TH | *as in* | THIN | TH | *as in* | THEN |
| S | *as in* | SINK | Z | *as in* | ZINC |
| SH | *as in* | ASSURE | ZH | *as in* | AZURE |
| CH | *as in* | CHOKE | J | *as in* | JOKE |
| K | *as in* | KATE | G | *as in* | GATE |
| | | | L | *as in* | LORE |
| | | | R | *as in* | ROAR |
| | | | Y | *as in* | YOUR |

A tonic consonant differs so markedly in acoustic effect from an atonic consonant that the ear as a rule readily distinguishes one from the other. If necessary, however, one or both of the following simple differentiating tests may be employed:

(1) Stop the ears with the fingers and produce first an atonic, then a tonic consonant. In one instance nothing will be noticed except the hiss or puff of escaping breath.

In the other there will be audible a distinct buzzing sound, whilst a slight vibration will communicate itself to the finger tips.

(2) Touch lightly with the finger tips the forward bulge of the thyroid cartilage (Adam's Apple) and produce as before, first an atonic, then a tonic consonant. In one instance nothing will be noted other than a possible up or down adjustment of the cartilage. In the other there will be felt a very noticeable vibration.

Two consonants which coincide in their noise components—differing only in that one is tonic and the other atonic—are known as *COGNATES*. Thus, the atonic consonant WH is the cognate of the tonic consonant W, P is the cognate of B, T of D, S of Z, SH of ZH, CH of J, F of V, K of G and TH as in THIN of TH as in THEN.

It is a good idea for the student of speech sounds to fix the distinction between tonic and atonic consonants by means of *cognate drills*. With one breath and with the same adjustment of the organs of articulation let him produce:

S-S-S-S-S-S-S-S-S-S-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z

F-F-F-F-F-F-F-F-F-F-V-V-V-V-V-V-V-V-V-V

SH-SH-SH-SH-SH-SH-SH-ZH-ZH-ZH-ZH-ZH-ZH

2. *Physiologic Consonant Classification.* On a physiologic basis consonants may be classified as:

(1) PLOSIVE

(2) FRICATIVE

The former term designates those consonants which are produced by the articulatory *interruption* of an expired breath stream.

The latter term designates those consonants which are

produced by the articulatory *constriction* of an expired breath stream.[3]

*Consonant Classification Chart No. 2*

| PLOSIVE CONSONANTS | | |
|---|---|---|
| P | *as in* | POND |
| B | *as in* | BOND |
| T | *as in* | TOWN |
| D | *as in* | DOWN |
| CH | *as in* | CHOKE |
| J | *as in* | JOKE |
| K | *as in* | KATE |
| G | *as in* | GATE |

| FRICATIVE CONSONANTS | | |
|---|---|---|
| WH | *as in* | WHAT |
| W | *as in* | WATT |
| F | *as in* | FINE |
| V | *as in* | VINE |
| TH | *as in* | THIN |
| TH | *as in* | THEN |
| S | *as in* | SINK |
| Z | *as in* | ZINC |
| SH | *as in* | ASSURE |
| ZH | *as in* | AZURE |
| L | *as in* | LORE |
| R | *as in* | ROAR |
| Y | *as in* | YOUR |

Phoneticians distinguish two steps in the production of a plosive consonant:

(1) Implosion—the stopping of an expired breath stream by an articulatory occlusion

(2) Explosion—the release of an expired breath stream by an articulatory separation

It is important to note in this connection that different modes of explosion are involved in the production of the plosive consonants listed on the preceding chart.

Thus, the explosion required for the production of certain plosive consonants is executed in such a manner that the expired breath stream is released *concentratedly* over a relatively limited frictional surface whilst the explosion

[3] Plosive consonants are readily distinguishable from fricative consonants in that only the latter can be prolonged.

required for the production of other plosive consonants is executed in such a manner that the expired breath stream is released *diffusely* over a relatively large frictional surface.

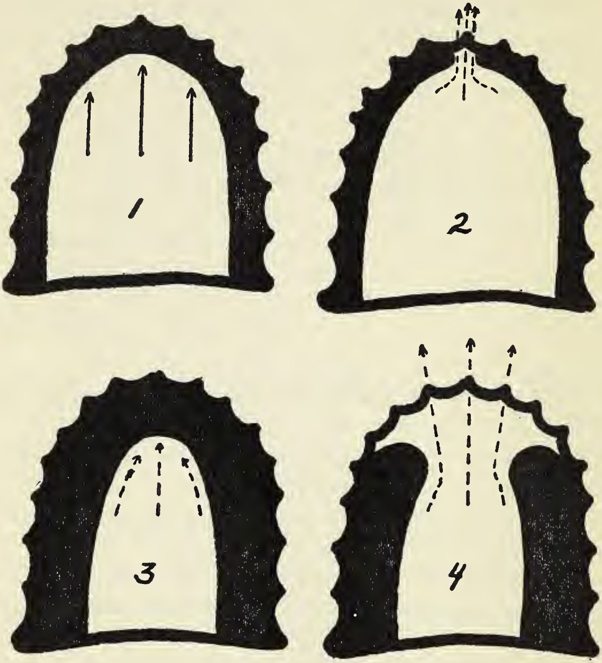



FIG. 17
Palatograms showing (1) implosion of plosive consonant T *as in* TOWN, (2) concentration of breath stream involved in explosion of T *as in* TOWN, (3) implosion of plosive consonant CH *as in* CHOKE and (4) diffusion of breath stream involved in explosion of CH *as in* CHOKE. (A "palatogram" is merely a diagrammatic representation of the mouth-roof. The shaded portions of such a diagram indicate points of lingual occlusion.)

For the production of the plosive consonant T *as in* TOWN, for example, a current of expired breath is blocked by an articulatory occlusion of the tip of the tongue against the gums of the upper teeth. This current is then released, concentratedly, thru a narrow aperture formed by the dropping of a carefully restricted portion of the middle of the tongue tip.

For the production of the plosive consonant CH *as in* CHOKE, on the other hand, a current of expired breath is blocked by an articulatory occlusion of the blade of the tongue against the gums of the upper teeth. This current is then released diffusely, thru a wide aperture formed by the dropping of practically the entire body of the tongue blade.

It is also important to note that different modes of constriction are involved in the production of the fricative consonants listed on the foregoing chart.

Thus, the constriction required for the production of certain fricative consonants is such that a stream of expired breath is squeezed concentratedly over a relatively limited frictional surface, whilst the constriction required for the production of other fricative consonants is such that a stream of breath is squeezed diffusely over a relatively large frictional surface.

For the production of the fricative consonant S *as in* SINK, for example, an expired breath stream is squeezed concentratedly thru a narrow aperture formed between the grooved blade of the tongue and the gum ridge of the upper front teeth.

For the production of the fricative consonant SH *as in* ASSURE, on the other hand, an expired breath stream is squeezed diffusely thru a wide aperture formed between

the arched blade of the tongue and the gum ridge of the upper front teeth.

For the convenience of our discussion, plosive consonants which are exploded and fricative consonants


FIG. 18

Palatograms showing (1) concentration of breath stream involved in production of fricative consonant S *as in* SINK and (2) diffusion of breath stream involved in production of fricative consonant SH *as in* ASSURE.

which are squeezed thru narrow apertures over relatively small frictional surfaces, will be designated as CONCENTRATED; plosive consonants which are exploded and fricative consonants which are squeezed thru wide apertures over relatively large frictional surfaces, will be designated as DISTRIBUTED.

The only consonant occurring in English speech which cannot be properly classified as either concentrated or distributed is the fricative consonant L *as in* LORE. This is produced by the constriction of an expired breath current thru two apertures rather than one, the tip of the

tongue being raised to the upper gum ridge in such a manner that the outgoing breath stream is forced to divide, one half of it passing on either side of the point of articulatory occlusion. We shall refer to this sound as neither concentrated nor distributed, using instead the new term LATERAL.

*Consonant Classification Chart No. 3*

| CONCENTRATED | DISTRIBUTED | LATERAL |
|---|---|---|
| WH *as in* WHAT | F *as in* FINE | L *as in* LORE |
| W *as in* WATT | V *as in* VINE | |
| P *as in* POND | TH *as in* THIN | |
| B *as in* BOND | TH *as in* THEN | |
| T *as in* TOWN | CH *as in* CHOKE | |
| D *as in* DOWN | J *as in* JOKE | |
| S *as in* SINK | SH *as in* ASSURE | |
| Z *as in* ZINC | ZH *as in* AZURE | |
| Y *as in* YOUR | R *as in* ROAR | |
| K *as in* KATE | | |
| G *as in* GATE | | |

3. *Anatomic Consonant Classification.* On an anatomic basis consonants may be classified as:

(1) BI-LABIAL
(2) LABIO-DENTAL
(3) LINGUA-DENTAL
(4) LINGUA-RUGAL
(5) LINGUA-PALATAL
(6) LINGUA-VELAR

The term bi-labial designates those consonants which are articulated by the two lips. (Latin *labia* = English *lips.*)

The term labio-dental designates those consonants which are articulated by the lower lip against the edges of the upper teeth. (Latin *dentes* = English *teeth.*)

The term lingua-dental designates those consonants which are articulated by the blade [4] of the tongue against the edges of the upper teeth. (Latin *lingua* = English *tongue.*)

The term lingua-rugal designates those consonants which are articulated by the tip [4] of the tongue against the gum ridge of the upper teeth. (The roughened portions of the gums just behind the upper front teeth are known to anatomists as the *rugæ.*)

The term lingua-palatal designates those consonants which are articulated by the blade or front [4] of the tongue against the hard palate.

The term lingua-velar designates those consonants which are articulated by the back [4] of the tongue against the soft palate. (The soft palate is known to anatomists as the *velum.*)

*Consonant Classification Chart No. 4*

| BILABIAL | LABIO DENTAL | LINGUA DENTAL | LINGUA RUGAL | LINGUA PALATAL | LINGUA VELAR |
|---|---|---|---|---|---|
| WH–WHAT | V–VINE | TH–THEN | T –TOWN | Y–YOUR | K–KATE |
| W –WATT | F–FINE | TH–THIN | D –DOWN | R–ROAR | G–GATE |
| P –POND | | | S –SINK | | |
| B –BOND | | | Z –ZINC | | |
| | | | CH–CHOP | | |
| | | | J –JOKE | | |
| | | | SH–SHOP | | |
| | | | ZH–AZURE | | |
| | | | L –LORE | | |

[4] For definition of *tip, blade, front* and *back* of tongue see p. 39–40.

4. *Classification of Consonants Summarized.* The chart on page 56 combines all three consonant classifications—acoustic, physiologic and anatomic. This chart the reader should study carefully until he is able to designate any given consonant thus:

P *as in* POND—atonic concentrated-plosive bi-labial

SH *as in* SHOP—atonic distributed-fricative lingua-rugal

G *as in* GATE—tonic concentrated-plosive lingua-velar

L *as in* LORE—tonic lateral-fricative lingua-rugal

Y *as in* YOUR—tonic concentrated-fricative lingua-palatal

For individual treatment of each consonant sound unit of English speech with diagrams and word lists, see "Sound Units in Detail," pp. 79 to 99.

**Classification of Vowel Sound Units.** The vowel sounds of English speech owe their distinctive qualities to the resonances given tones initiated in the larynx by certain definite and characteristic configurations of the mouth cavity. These configurations vary according to and may be classified upon the basis of:

(1) the horizontal position occupied in the mouth cavity by the highest part of the tongue

(2) the vertical position occupied in the mouth cavity by the highest part of the tongue

(3) the shape of the tongue

(4) the position of the lips

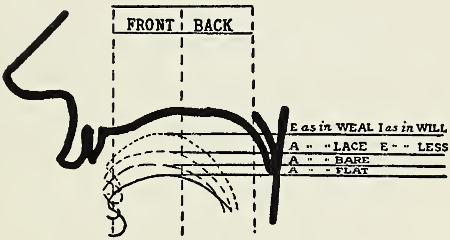
(1) *Front, Back and Mixed Vowels.* On the basis of the horizontal position occupied in the mouth cavity by the highest part of the tongue the vowel sounds of English speech may be classified as FRONT, BACK and MIXED.

*Consonant Classification Chart No. 5*

| | FRICATIVE | | | | | | PLOSIVE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CONCENTRATED | | DISTRIBUTED | | LATERAL | | CONCENTRATED | | DISTRIBUTED | | LATERAL | |
| | ATONIC | TONIC | ATONIC | TONIC | ATONIC | TONIC | ATONIC | TONIC | ATONIC | TONIC | ATONIC | TONIC |
| BI LABIAL | WH *as in* WHAT | W *as in* WATT | | | | | P *as in* POND | B *as in* BOND | | | | |
| LABIO DENTAL | | | F *as in* FINE | V *as in* VINE | | | | | | | | |
| LINGUA DENTAL | | | TH *as in* THIN | TH *as in* THEN | | | | | | | | |
| LINGUA RUGAL | S *as in* SINK | Z *as in* ZINC | SH *as in* SHOP | ZH *as in* AZURE | | L *as in* LORE | T *as in* TOWN | D *as in* DOWN | CH *as in* CHOKE | J *as in* JOKE | | |
| LINGUA PALATAL | | Y *as in* YOUR | | R *as in* ROAR | | | | | | | | |
| LINGUA VELAR | | | | | | | K *as in* KATE | G *as in* GATE | | | | |

For the production of the vowels E *as in* WEAL, I *as in* WILL, A *as in* LACE, E *as in* LESS, A *as in* BARE and A *as in* FLAT, the highest part of the tongue must lie in the front of the mouth—i. e., the front of the tongue must be elevated to a perceptibly higher level than the back so that the mouth cavity is shaped with a relatively small outlet and a relatively large inlet. These vowels we shall designate by the term FRONT. (Chart No. 1)

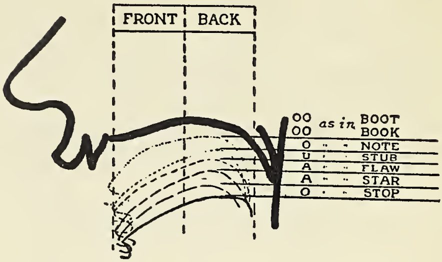
*Vowel Classification Chart No. 1*




For the production of the vowels OO *as in* BOOT, OO *as in* BOOK, O *as in* NOTE, U *as in* STUB, A *as in* FLAW, A *as in* STAR and O *as in* STOP the highest part of the tongue must lie in the back of the mouth—i. e., the back of the tongue must be raised to a perceptibly higher level than the front so that the mouth cavity is shaped with a relatively small inlet and a relatively large outlet. These vowels we shall designate by the term BACK. (Chart No. 2)

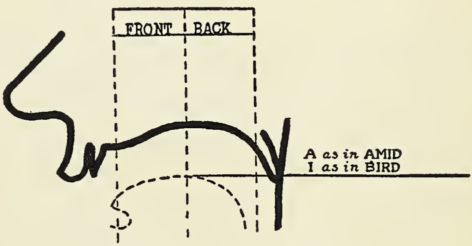
For the production of the vowels I *as in* BIRD and A *as in* AMID the highest part of the tongue should lie neither in the back nor in the front of the mouth—i. e.,

*Vowel Classification Chart No. 2*




the tongue should occupy a neutral, flattened position so that the mouth cavity is shaped with a moderately large inlet and a moderately large outlet. These vowels we shall designate by the term MIXED. (Chart No. 3)

*Vowel Classification Chart No. 3*




Vowel classification on the basis of the horizontal position occupied in the mouth by the highest part of the tongue may be summarized as follows:

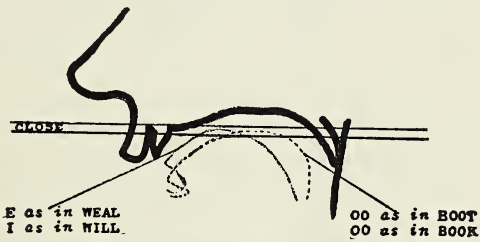
*Vowel Classification Chart No. 4*

| FRONT | MIXED | BACK |
|---|---|---|
| E *as in* WEAL | I *as in* BIRD | OO *as in* BOOT |
| I *as in* WILL | A *as in* AMID | OO *as in* BOOK |
| A *as in* LACE | | O *as in* NOTE |
| E *as in* LESS | | U *as in* STUB |
| A *as in* BARE | | A *as in* FLAW |
| A *as in* FLAT | | A *as in* STAR |
| | | O *as in* STOP |

(2) *Close, Open and Intermediate Vowels.* On the basis of the vertical position occupied in the mouth cavity by the highest part of the tongue, the vowel sounds of English speech may be classified as CLOSE, OPEN and INTERMEDIATE.

For the production of the vowels E *as in* WEAL, I *as in* WILL, OO *as in* BOOT and OO *as in* BOOK the highest part of the tongue must lie in the extreme upper

*Vowel Classification Chart No. 5*

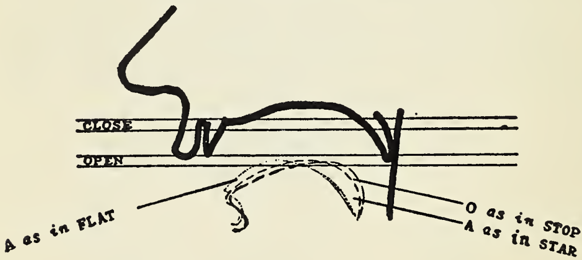



portion of the mouth cavity—i. e., either the back or the front of the tongue must assume a position as close to the roof of the mouth as it can possibly take without

constricting the expired breath stream so as to cause audible friction (and thus convert the vowel into a consonant). These vowels we shall designate by the term CLOSE. (Chart No. 5)

For the production of the vowels A *as in* FLAT, A *as in* STAR and O *as in* STOP the highest part of the tongue must lie in the extreme lower part of the mouth cavity—i. e., the lower jaw must drop to an open position, and the tongue mass must press as far as possible toward the floor of the mouth. These vowels we shall designate as OPEN. (Chart No. 6)

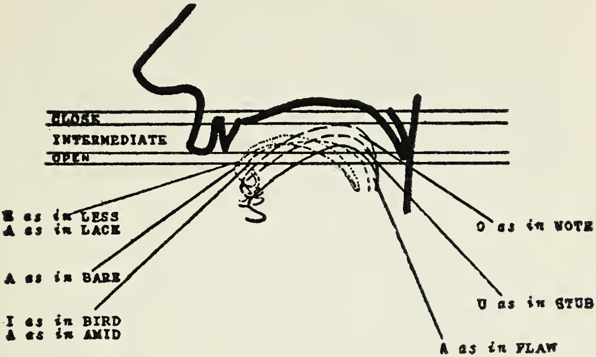
*Vowel Classification Chart No.* 6




For the production of the vowels E *as in* LESS, A *as in* LACE, A *as in* BARE, O *as in* NOTE, U *as in* STUB, A *as in* FLAW, I as in BIRD and A *as in* AMID, the highest part of the tongue must lie in the middle portion of the mouth cavity—i. e., it must assume a position somewhere between the close level and the open level. These vowels we may designate as INTERMEDIATE.

It is convenient to subdivide the intermediate vowels

*Vowel Classification Chart No. 7.*



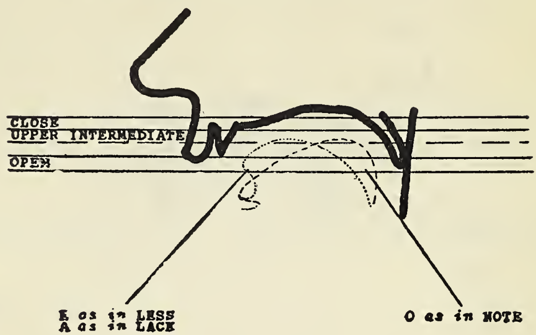

indicated on the preceding chart into two groups—upper intermediate vowels and lower intermediate vowels.[5]

For the production of the vowels E *as in* LESS, A *as in* LACE and O *as in* NOTE the highest part of the tongue must lie in the upper half of the middle of the mouth—i. e., it must assume a position approximately one third of the distance from the close level to the open level. These vowels we shall designate as UPPER INTERMEDIATE. (Chart No. 8)

For the production of the vowels A *as in* BARE, U *as in* STUB, I *as in* BIRD and A *as in* AMID the highest part of the tongue must lie in the lower half of the middle of the mouth—i. e., it must assume a position approximately two thirds the distance from the close level

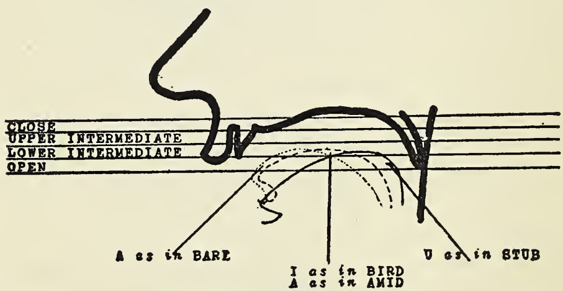
[5] The terms upper intermediate and lower intermediate employed here are replaced in the writings of some phoneticians by the terms half-close and half-open.

*Vowel Classification Chart No. 8*




to the open level. These vowels we shall designate as LOWER INTERMEDIATE. (Chart No. 9)

*Vowel Classification Chart No. 9*




Vowel classification on the basis of the vertical positions assumed in the mouth cavity by the highest part of the tongue may be summarized as follows:

*Vowel Classification Chart No. 10*

| CLOSE | UPPER INTERMEDIATE | LOWER INTERMEDIATE | OPEN |
|---|---|---|---|
| E *as in* WEAL | A *as in* LACE | A *as in* BARE | A *as in* FLAT |
| I *as in* WILL | E *as in* LESS | A *as in* FLAW | A *as in* STAR |
| OO *as in* BOOT | O *as in* NOTE | I *as in* BIRD | O *as in* STOP |
| OO *as in* BOOK | | A *as in* AMID | |
| | | U *as in* STUB | |

(3) *Concave and Convex Vowels.* On the basis of *tongue shape* the vowel sounds of English speech may be classified as CONVEX and CONCAVE.[6]

If the reader will observe his tongue with the aid of a mirror, he will note that it appears concave from side to side—that is, the medial section of the surface of his tongue extending from front to rear appears to be depressed.

For the production of the vowel E *as in* WEAL, A *as in* LACE, A *as in* BARE, I *as in* BIRD, OO *as in* BOOT, O *as in* NOTE and A *as in* FLAW, the tongue must be bunched up lengthwise so that the medial depression just mentioned is largely overcome, the surface of the tongue losing its usual side-to-side concavity. These vowels we shall designate as CONVEX.

For the production of the vowels I *as in* WILL, E *as in* LESS, A *as in* FLAT, A *as in* AMID, OO *as in* BOOK, U *as in* STUB, O *as in* STOP and A *as in* STAR the tongue must retain a relatively deep medial depression. These vowels we shall designate as CONCAVE.

Convex vowels may be distinguished from concave vowels in that the former are accompanied by a per-

[6] The terms *convex* and *concave* employed here are replaced in the writings of some phoneticians by the terms *tense* and *lax* and in the writings of other phoneticians by the terms *narrow* and *wide.*

ceptible feeling of tongue *tension* whilst the latter are accompanied by an equally perceptible feeling of tongue

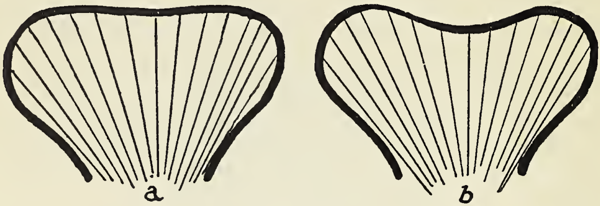



FIG. 19
Diagrammatic cross section of front of tongue, showing (a) adjustment for production of the convex vowel E *as in* WEAL and (b) adjustment for production of the concave vowel I *as in* WILL.

*laxness.* If necessary the following supplementary differentiating tests may be employed:

Place the finger lightly against that portion of the throat which lies between the "Adam's Apple" and the chin. If during the production of a given vowel this portion of the throat feels loose, the vowel is probably *concave;* if it pushes forward somewhat and feels tense, the vowel is probably *convex.*

*Vowel Classification Chart No. 11*

| CONVEX | CONCAVE |
|---|---|
| E *as in* WEAL | I *as in* WILL |
| A *as in* LACE | E *as in* LESS |
| A *as in* BARE | A *as in* FLAT |
| OO *as in* BOOT | OO *as in* BOOK |
| O *as in* NOTE | U *as in* STUB |
| A *as in* FLAW | A *as in* STAR |
| I *as in* BIRD | O *as in* STOP |
| | A *as in* AMID |

(4) *Rounded and Unrounded Vowels.* On the basis of the position assumed by the lips the vowel sounds of English speech may be classified as ROUNDED and UN-ROUNDED.

For the production of the vowels OO *as in* BOOT, OO *as in* BOOK, O *as in* NOTE, A *as in* FLAW and O *as in* STOP the lips must be drawn together and slightly protruded in a manner to form a rounded, relatively small aperture. These vowels we shall designate as ROUNDED.

For the production of the vowels E *as in* WEAL, I *as in* WILL, A *as in* LACE, E *as in* LESS, A *as in* BARE, A *as in* FLAT, I *as in* BIRD, A *as in* AMID, A *as in* STAR and U *as in* STUB, the lips must be either left in a neutral position or spread out in a manner to form a long narrow aperture. These vowels we shall designate as UNROUNDED.

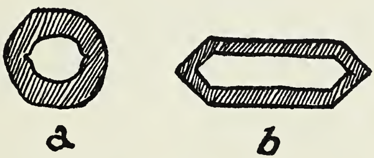



FIG. 20
Front view of the lips adjusted for production of (a) rounded vowel OO *as in* BOOT and (b) unrounded vowel E *as in* WEAL.

It will be noted from the following chart that all the FRONT and MIXED vowels of English speech are unrounded—whilst all the BACK vowels, with the exception of U *as in* STUB and A *as in* STAR, are rounded.

*Vowel Classification Chart No. 12*

| ROUNDED VOWELS | | | UNROUNDED VOWELS | | |
|---|---|---|---|---|---|
| OO | *as in* | BOOT | E | *as in* | WEAL |
| OO | *as in* | BOOK | I | *as in* | WILL |
| O | *as in* | NOTE | A | *as in* | LACE |
| A | *as in* | FLAW | E | *as in* | LESS |
| O | *as in* | STOP | A | *as in* | BARE |
| | | | A | *as in* | FLAT |
| | | | I | *as in* | BIRD |
| | | | A | *as in* | AMID |
| | | | A | *as in* | STAR |
| | | | U | *as in* | STUB |

(5) *Classification of Vowels Summarized.* The following chart combines all four vowel classifications—(1) classification on the basis of the *horizontal* position occupied in the mouth cavity by the highest part of the tongue, (2) classification on the basis of the *vertical* position occupied in the mouth cavity by the highest part of the tongue, (3) classification on the basis of the *shape* of the tongue, and (4) classification on the basis of the *position assumed by the lips.* This chart the reader should study carefully until he is able to classify any given vowel sound as follows:

E *as in* WEAL—front close convex unrounded

A *as in* FLAW—back open convex rounded

OO *as in* BOOK—back close concave rounded

A *as in* BARE—front lower-intermediate convex rounded

E *as in* LESS—front upper-intermediate concave unrounded

For individual treatment of each vowel unit of English speech with diagrams and word lists, see "Sound Units in Detail," pp. 104 to 118.

*Vowel Classification Chart No. 13*

| | | FRONT | | MIXED | | BACK | |
|---|---|---|---|---|---|---|---|
| | | ROUNDED | UNROUNDED | ROUNDED | UNROUNDED | ROUNDED | UNROUNDED |
| CLOSE | CONVEX | | E *as in* WEAL | | | OO *as in* BOOT | |
| | CONCAVE | | I *as in* WILL | | | OO *as in* BOOK | |
| UPPER INTER-MEDIATE | CONVEX | | A *as in* LACE | | | O *as in* NOTE | |
| | CONCAVE | | E *as in* LESS | | | | |
| LOWER INTER-MEDIATE | CONVEX | | A *as in* BARE | | I *as in* BIRD | A *as in* FLAW | |
| | CONCAVE | | | | A *as in* AMID | | U *as in* STUB |
| OPEN | CONVEX | | | | | | |
| | CONCAVE | | A *as in* FLAT | | | O *as in* STOP | A *as in* STAR |

**Classification of Nasal Resonants.** The nasal resonants may be conveniently classified on an anatomic basis as (1) BI-LABIAL, (2) LINGUA-RUGAL and (3) LINGUA-VELAR.

For the production of the nasal resonant M *as in* RUM the vocal chords must be thrown into vibration by a current of expired breath, the soft palate must be lowered from its usual [7] position of occlusion against the pharyngeal wall and the mouth passage must be blocked by the *closure of the lips.* This nasal resonant we shall designate as BI-LABIAL.

For the production of the nasal resonant N *as in* STUN the vocal chords must be thrown into vibration by a current of expired breath, the soft palate must be lowered from its usual position of occlusion against the pharyngeal wall and the mouth passage must be blocked by an *elevation of the blade of the tongue to the gum ridge of the upper teeth.* This nasal resonant we shall designate as LINGUA-RUGAL.

For the production of the nasal resonant NG *as in* RUNG the vocal chords must be thrown into vibration by a current of expired breath, the soft palate must be lowered from its usual position of occlusion against the pharyngeal wall and the mouth passage must be blocked by an *elevation of the back of the tongue to the soft palate.* This nasal resonant we shall designate as LINGUA-VELAR.

For further treatment of nasal resonants with diagrams

[7] The nasal resonants are the only sound units of standard English speech for the production of which the soft palate should be lowered from a position of occlusion against the pharyngeal wall.

and words lists see "Sound Units in Detail," pp. 100 to 102.

**Sound Groups.** The consonants, vowels and nasal resonants that we have just classified do not occur separately in normal speech but rather as integral members of *sound groups.*

Two kinds of sound groups are distinguishable in normal connected speech:

(1) Syllables

(2) Breath-groups

**Syllables.** Syllables are sound groups of connected speech which are marked off by perceptible differences in the sonority of successive sound units. A general rule for syllabication may be formulated thus:

*When two relatively sonorous sound units (usually vowels) are separated by one or more relatively non-sonorous sound units (usually consonants or nasal resonants), the former belong to different syllables.*

Thus in the word UNCOUTH, the sonorous vowel U *as in* STUB is separated from the sonorous vowel OO *as in* BOOT by the non-sonorous nasal resonant N *as in* STUN and the non-sonorous consonant K *as in* KATE. The vowels U *as in* STUB and OO *as in* BOOT, therefore, are *syllabic*—that is, they constitute the acoustic nuclei for two different syllables.

In order that two vowels which occur consecutively may belong to different syllables there must be either a slight decrease in the force of breath between them (e. g., CO—decrease in force of breath—EQUAL) or the tiniest trace of a consonantal sound must be inserted (e. g., PRE—insertion of Y *as in* YET—EMINENT).

**Diphthongs.** When two vowels occur consecutively and yet are not separated by a decrease in breath force or by the insertion of a consonantal sound, they do not syllabicate—forming instead, a monosyllabic blend known as a DIPHTHONG.[8] There are five important diphthongs in standard English speech.

*Diphthong Chart*

| KEY WORD CONTAINING DIPHTHONG | ACOUSTIC COMPOSITION OF DIPHTHONG |
|---|---|
| COW | A *as in* STAR + OO *as in* BOOT |
| PIE | A *as in* STAR + E *as in* WEAL |
| BOY | A *as in* FLAW + E *as in* WEAL |
| PAY | A *as in* LACE + E *as in* WEAL |
| WOE | O *as in* NOTE + OO *as in* BOOT |

**Breath Groups.** A breath group may be defined as a series of consecutive syllables which is uttered without pause. Inasmuch as pauses are necessary at frequent intervals in connected speech

(1) to replenish the air supply of the lungs and
(2) to clarify meaning

every utterance of moderate length must be divided into two or more breath groups. For the convenience of the reader the following chart has been prepared to illustrate the general methods of breath grouping employed in standard English speech.

[8] It should be noted that every diphthong is in reality a *multiphthong* since it comprises not only an initial and a final vowel but a theoretically infinite number of *transitional* vowels as well.

*Breath Group Analysis Chart*

KEY { Slight Pause / <br> Decided Pause //

| SAMPLE UTTERANCE | UTTERANCE BREATH-GROUPED |
| --- | --- |
| (1) Go! Leave this place! Get out at once or I'll throw you out! | (1) Go // Leave this place // Get out at once / or I'll throw you out // |
| (2) Fourscore and seven years ago our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal. | (2) Fourscore and seven years ago// our fathers brought forth on this continent/ a new nation// conceived in liberty// and dedicated to the proposition/ that all men are created equal// |
| (3) Exposition is an explanation, a setting forth, or an expounding. It is an attempt to render something plain, an effort to convey to the reader a train of thought which represents the conclusion of the writer upon a subject. | (3) Exposition is an explanation // a setting forth // or an expounding // It is an attempt to render something plain // an effort to convey to the reader a train of thought which represents the conclusions of the writer / upon a subject // |
| (4) Heard melodies are sweet but those unheard are sweeter; therefore, ye soft pipes, play on; not to the sensual ear, but, more endeared, pipe to the spirit ditties of no tone. | (4) Heard melodies are sweet // but those unheard are sweeter // therefore ye soft pipes / play on // not to the sensual ear / but more endeared // pipe to the spirit ditties of no tone // |

Pauses for breath, the reader will note from the preceding chart, should occur only at such points in an utterance where pauses are necessary or permissible from the standpoint of thought interpretation.

**Stress.** An important factor to be considered in an acoustic analysis of connected speech is *stress.* By this term we mean the amount of expiratory force involved in the production of a given syllable as compared with the amount of expiratory force involved in the production of neighboring syllables. Thus in the word PAR-TY the first syllable is produced with more expiratory force (i. e., it is *stressed* more) than the last syllable; in the word DIS-PLAY the last syllable is produced with more expiratory force than the first; whilst in the word TRE-MEN-DOUS the middle syllable is produced with more expiratory force than either the first or the last.

While it is possible to distinguish a great many degrees of stress, it will suffice for the purposes of our analysis if we distinguish three. In the following chart, hence, we shall refer to:

(1) *Stressed Syllables*
(2) *Half-Stressed Syllables*
(3) *Unstressed Syllables*

*Stress Analysis Chart*

KEY
- Stressed Syllables—**heavy type**
- Half-Stressed Syllables—*italics*
- Unstressed Syllables—light type

| WORD | SYLLABIC STRESS |
|---|---|
| unfamiliar | *un*—fa—**mil**—iar |
| automobile | **au**—to—mo—*bile* |
| divide | *di*—**vide** |
| tremendous | tre—**men**—*dous* |
| opportunity | *opp*—or—**tun**—i—ty |
| diphthong | ***diph***—*thong* |
| comparable | **com**—par—a—ble |

| WORD | SYLLABIC STRESS |
|---|---|
| attacked | at—**tacked** |
| dimension | di—**men**—sion |
| evaporate | e—**vap**—o—*rate* |
| ministerial | *min*—is—**ter**—i—al |
| adamant | **ad**—am—ant |
| quiescent | qui—**es**—cent |
| lethargic | le—**thar**—gic |
| innovation | *in*—no—**va**—tion |
| predominate | pre—**dom**—in—*ate* |

The reader should not infer from the preceding chart that the syllables of a given word [9] are always stressed in the same way. Variations of syllable stress within a given word frequently occur for purposes of:

(1) Thought Clarification

e. g.— He is most im—**mod**—er—ate.
You say he is moderate?
I think he is **im**—*mod*—er—ate!

(2) Speech Rhythm

e. g.— An un—*known* land.
Quite **un**—known.

**Quantity.** Another important factor to be considered in an acoustic analysis of connected speech is *quantity.* By this term we mean the amount of time consumed by the production of one speech sound as compared to the amount of time devoted to the production of a neighboring speech sound in a given utterance.

[9] The word cannot be treated in this discussion since it is a *graphic* and *logical* unit rather than a *phonetic* unit. No amount of purely acoustic analysis, for example, will enable us to recognize the word units in an utterance delivered in an unfamiliar language.

On the basis of quantity the sound units in a connected utterance may be classified as:

(1) Long
(2) Half-long
(3) Short

The approximate rules governing the occurrence of long, half-long and short sounds in connected English speech may be summarized as follows:

### I. *Rules for Vowel Quantity*

1. E *as in* EAT, A *as in* STAR, A *as in* FLAW, OO *as in* BOOT, and I *as in* BIRD, are *long:*

(a) When in stressed syllables
(b) When followed by a voiced consonant or a nasal resonant
(c) When final

2. E *as in* EAT, A *as in* STAR, A *as in* FLAW, OO *as in* BOOT, and I *as in* BIRD, are *half-long:*

(a) When in unstressed syllables
(b) When followed by a breathed consonant
(c) When followed by another vowel

3. I *as in* WILL, E *as in* LESS, A *as in* FLAT, O *as in* STOP, U *as in* STUB, and OO *as in* BOOK, are generally short, but are *half-long:*

(a) When in stressed syllables
(b) When followed by a voiced consonant other than L or R

4. A *as in* AMID (which occurs only in unstressed syllables) and unstressed I *as in* WILL, are practically always *short.*

### II. *Rules for Consonant Quantity*

1. Consonants are slightly lengthened, i. e., they are *half-long:*

(a) When final
(b) When preceded by a short stressed vowel

2. Consonants are *short:*
   (a) When preceded by a long stressed vowel
   (b) When syllabic

### III. *Rules for Nasal Resonant Quantity*

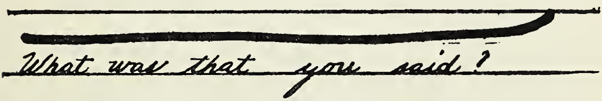
1. Nasal resonants are *long:*
   (a) When final
   (b) When preceded by short stressed vowels
   (c) When preceded by a voiced consonant in the same syllable
2. Nasal resonants are *short:*
   (a) When preceded by a stressed long vowel
   (b) When syllabic

### IV. *Rules for Diphthong Quantity*

1. Diphthongs may be either *long* or *short.* They are treated like the vowels E *as in* WEAL, A *as in* STAR, A as in FLAW, OO *as in* BOOT and I *as in* BIRD—with the exception that they become *short* when the latter become *half-long.* (See Rules for Vowel Quantity No. 1 and 2.)

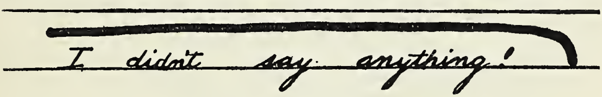
**Intonation.** Still another important factor to be considered in an acoustic analysis of connected speech is *intonation*—i. e., the rise and fall of the voice pitch.

When the pitch of the voice rises, as in the sentence—



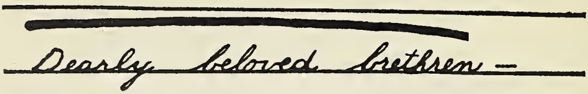

we have what is known as a *rising intonation.*

When the pitch of the voice falls, as in the sentence—




we have what is known as a *falling intonation.*

When the pitch of the voice remains constant over an appreciable period of time, as in a religious chant,




we have what is known as a *level intonation.*

There are no definite rules for the occurrence of rising and falling intonations [10] in standard English speech. The few general approximations formulated by phoneticians may be summarized as follows:

I. *A rising intonation is commonly found at the end of:*

(1) Unfinished commands

(2) Unfinished statements

(3) Complete questions not containing a specific interrogative word or phrase

(4) Dependent clauses, when the principal clause follows

II. *A falling intonation is commonly found at the end of:*

(1) Complete commands

(2) Complete statements (i.e., statements which do not imply continuation)

(3) Complete questions containing a specific interrogative word or phrase

(4) The last of two or more alternative questions

The reader must not think for a moment that the grammatical considerations noted above are the only determinants of voice intonations. Intonations are primarily indices of *human emotional attitudes*—but these latter are far too complex for us to illustrate systematically or utilize as a basis for phonetic classification.

[10] Level intonations are not employed in standard English speech except under peculiar and unnatural circumstances.

# CHAPTER III

## *SOUND UNITS IN DETAIL*

For the convenience of the reader, each of the sound units of standard English speech is subjected in this chapter to a separate pictorial analysis.

**Consonant Key.** The analysis of each consonant sound is illustrated by a large cross-section diagram of the oral cavity, together with four supplementary diagrammatic inserts.

The upper and lower left inserts explain how the breath stream is manipulated in the articulation of the consonant. This explanation is effected in some cases by means of a palatogram (see page 87), in other cases by means of a cross-section "close-up" of the articulating organs (see page 81), in still other cases by a combination of both devices (see page 89). The dotted lines on these inserts show the direction taken by the breath stream and indicate whether it is concentrated, distributed or lateral.

The upper right insert shows how the lips should look viewed from the front during the production of the consonant.

The lower right insert pictures the vocal chords and indicates, by their position, whether the consonant is tonic or atonic.

**Vowel Key.** The analysis of each vowel sound is also

illustrated by a large cross-section diagram, together with four supplementary inserts.

The upper left of these inserts shows schematically how far the jaws should be separated during the production of the vowel.

The lower left insert indicates whether the tongue should be convex or concave.

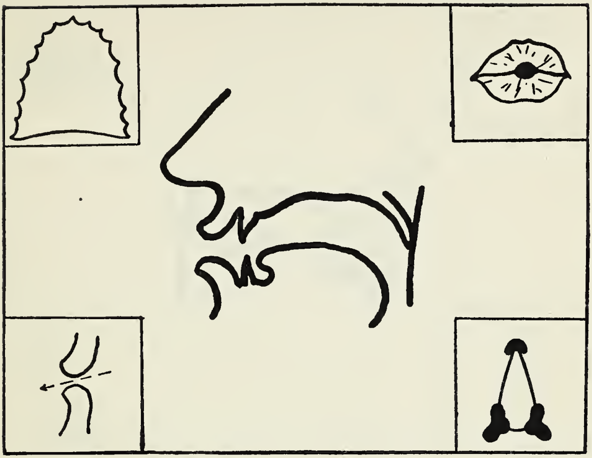
The upper and lower right inserts, as in the case of the consonant illustrations, picture the lips viewed from the front and the vocal chords.

**Nasal Resonant Key.** The analysis of the nasal resonants is illustrated in the same manner as the analysis of the consonants.

**Glottal Aspirate Key.** The glottal aspirate H as in HAND is illustrated in its analysis by a diagrammatic horizontal cross-section of the vocal chords.

**Word Lists.** At the conclusion of the chapter will be found carefully prepared word lists illustrating the occurrence of each of the sound units of standard English speech in varied word positions—initial, medial and final.

## WH *as in* WHAT



*Classification:*

Atonic concentrated-fricative bilabial CONSONANT.

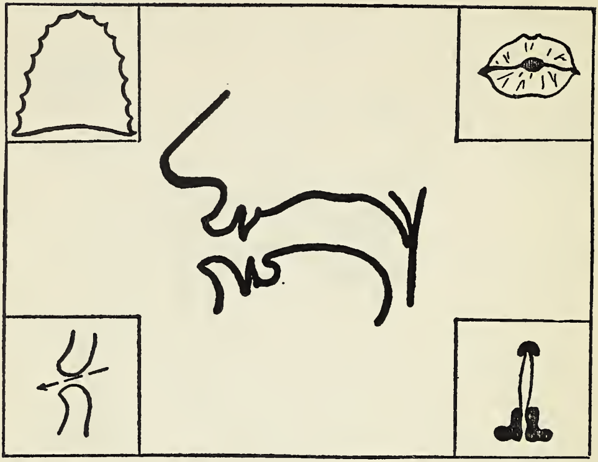
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Thrust slightly forward and approximate the lips in such a manner that a rounded, relatively small aperture is left between them.

(3) Squeeze thru this aperture a vigorous current of *unvocalized* breath (i. e., a current of breath which has passed thru the glottis without affecting the vocal chords).

## W *as in* WATT



*Classification:*

Tonic concentrated-fricative bilabial CONSONANT.

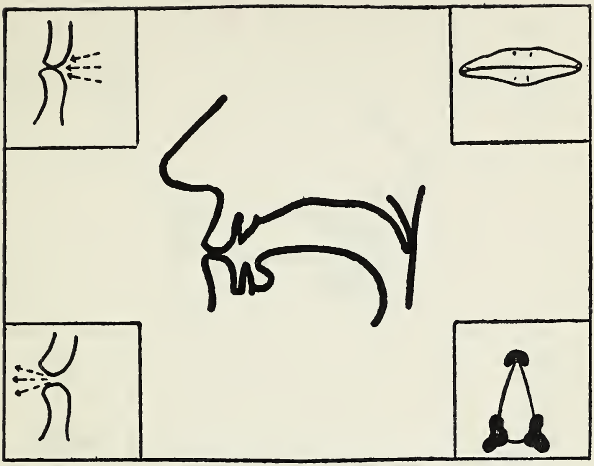
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Thrust slightly forward and approximate the lips in such a manner that a rounded, relatively small aperture is left between them.

(3) Expel thru this aperture a current of *vocalized* breath (i. e., a current of breath which has thrown the vocal chords into sonant vibration while passing thru the glottis).

P *as in* POND



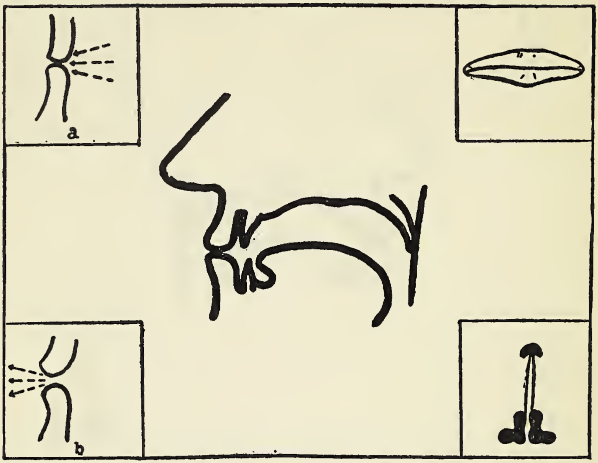
*Classification:*

Atonic concentrated-plosive bilabial CONSONANT.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.
(2) Bring the two lips into air-tight occlusion.
(3) Permit a stream of expired breath (*unvocalized*) to mount up in pressure behind this articulatory dam.
(4) Release the stream of expired breath in a sudden, concentrated puff.

B *as in* BOND



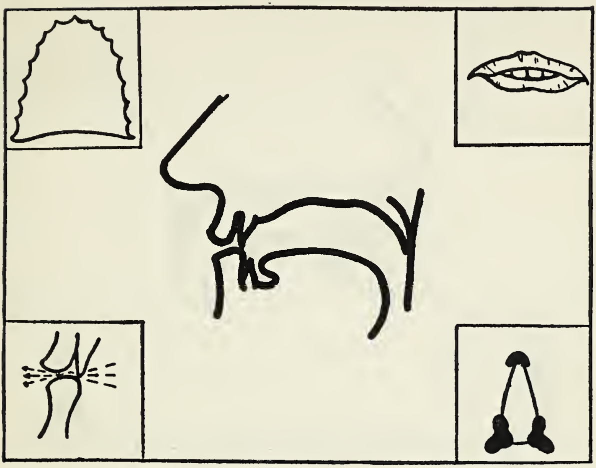

*Classification:*

Tonic concentrated-plosive bilabial CONSONANT.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.
(2) Bring the two lips into air-tight occlusion.
(3) Permit a stream of expired breath (*vocalized*) to mount up in pressure behind this articulatory dam.
(4) Release the expired breath stream in a sudden, concentrated puff.

F *as in* FINE



*Classification:*

Atonic distributed-fricative labio-dental CONSONANT.

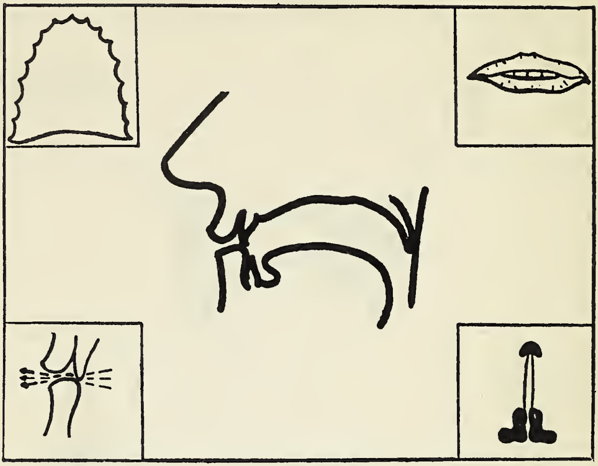
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the lower lip gently into occlusion with the edges of the upper front teeth.

(3) Expel thru the interproximal spaces of these teeth (and thru the irregular gaps left between the edges of the teeth and the occludal surface of the lower lip) a current of *unvocalized* breath.

V *as in* VINE



*Classification:*

Tonic distributed-fricative labio-dental CONSONANT.

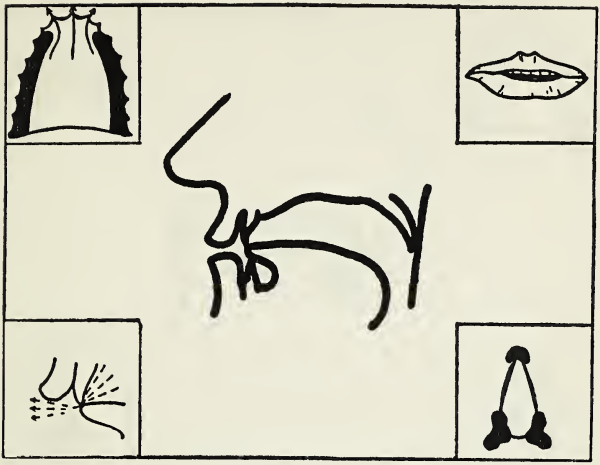
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the lower lip gently into occlusion with the edges of the upper front teeth.

(3) Expel thru the interproximal spaces of these teeth (and thru the irregular gaps left between the edges of the teeth and the occludal surface of the lower lip) a current of *vocalized* breath.

## TH *as in* THIN



*Classification:*

Atonic distributed-fricative lingua-dental CONSONANT.

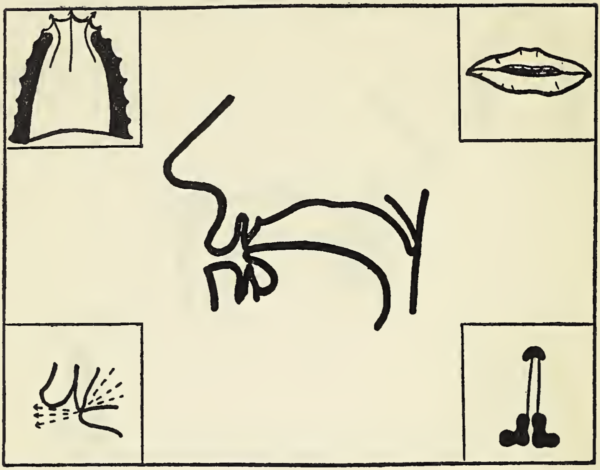
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the tip of the tongue gently into occlusion with the edges of the upper front teeth.

(3) Expel thru the interproximal spaces of these teeth (and thru the irregular gaps left between the edges of the teeth and the surface of the tongue) a current of *unvocalized* breath.

TH *as in* THEN



*Classification:*

Tonic distributed-fricative lingua-dental CONSONANT.

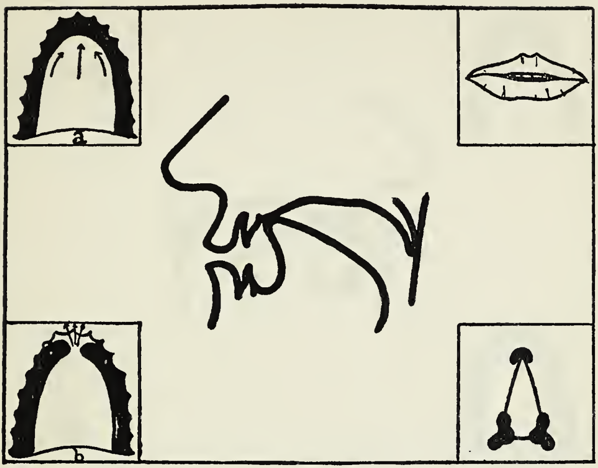
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the tip of the tongue gently into occlusion with the edges of the upper front teeth.

(3) Expel thru the interproximal spaces of these teeth (and thru the irregular gaps left between the edges of the teeth and the surface of the tongue) a current of *vocalized* breath.

## T *as in* TOWN




*Classification:*

Atonic concentrated-plosive lingua-rugal CONSONANT.

*Production:*

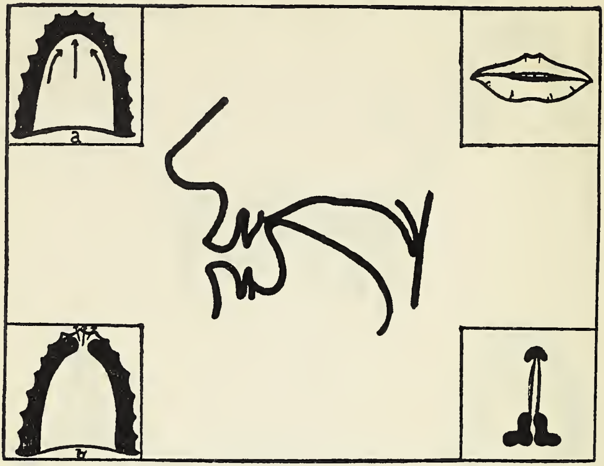
(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the tip of the tongue into air-tight occlusion with the gum ridge of the upper teeth.

(3) Permit a current of expired breath (*unvocalized*) to mount up in pressure behind this articulatory dam (fig. a).

(4) Drop the middle portion of the tongue tip suddenly, releasing the expired breath stream in a concentrated puff (fig. b).

## D *as in* DOWN



*Classification:*

Tonic concentrated-plosive lingua-rugal CONSONANT.

*Production:*

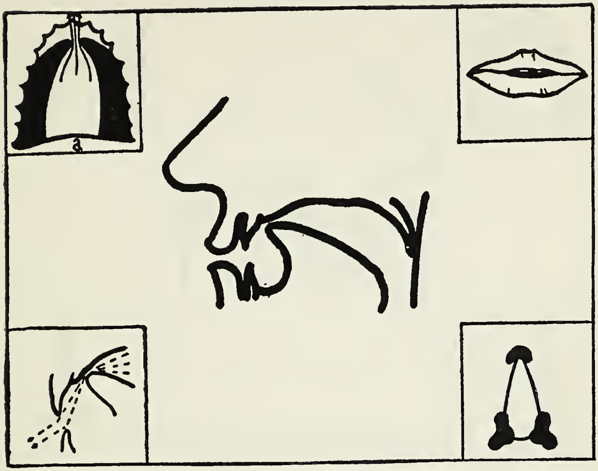
(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the tip of the tongue into air-tight occlusion with the gum ridge of the upper teeth.

(3) Permit a current of expired breath (*vocalized*) to mount up in pressure behind this articulatory dam (fig. a).

(4) Drop the middle portion of the tongue tip suddenly, releasing the expired breath stream in a concentrated puff (fig. b).

## S *as in* SINK




*Classification:*

Atonic concentrated-fricative lingua-rugal CONSONANT.

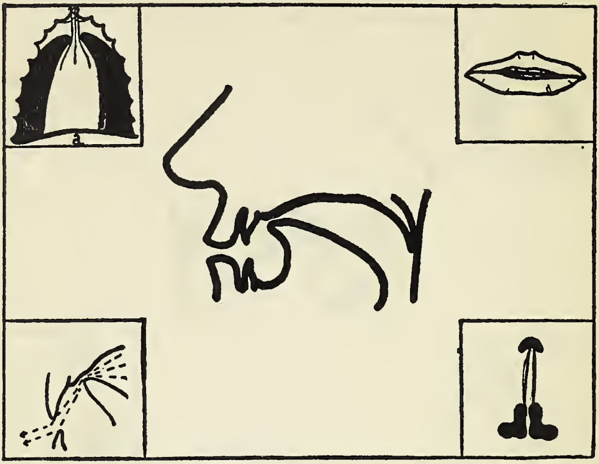
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Groove the tip of the tongue and adjust it against the gum ridge of the upper teeth in a manner to form the minute articulatory aperture shown on the accompanying palatogram (fig. a).

(3) Expel a current of *unvocalized* breath thru this aperture.

## Z *as in* ZINC



*Classification:*

Tonic concentrated-fricative lingua-rugal CONSONANT.

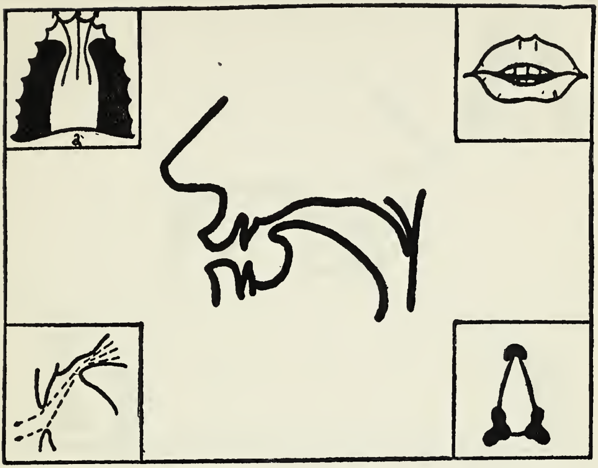
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Groove the tip of the tongue and adjust it against the gum ridge of the upper teeth in a manner to form the minute articulatory aperture shown on the accompanying palatogram (fig. a).

(3) Expel a current of *vocalized* breath thru this aperture.

## SH *as in* ASSURE



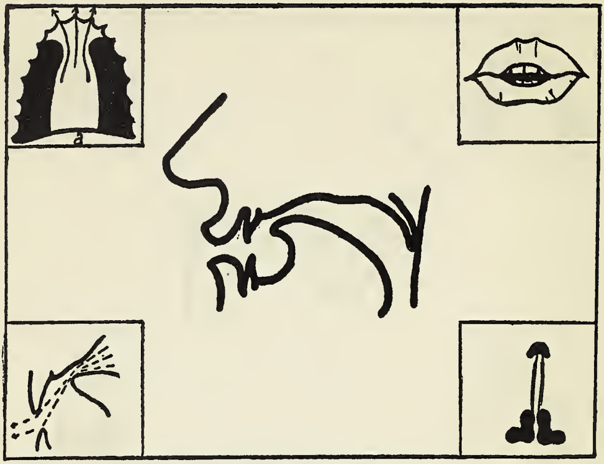

*Classification:*

Atonic distributed-fricative lingua-rugal CONSONANT.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.
(2) Arch the blade of the tongue and adjust it against the gum ridge of the upper teeth in a manner to form the wide articulatory aperture shown on the accompanying palatogram (fig. a).
(3) Thrust forward and slightly round the lips.
(4) Expel a current of *unvocalized* breath.

## ZH *as in* AZURE




*Classification:*

Tonic distributed-fricative lingua-rugal CONSONANT.

*Production:*

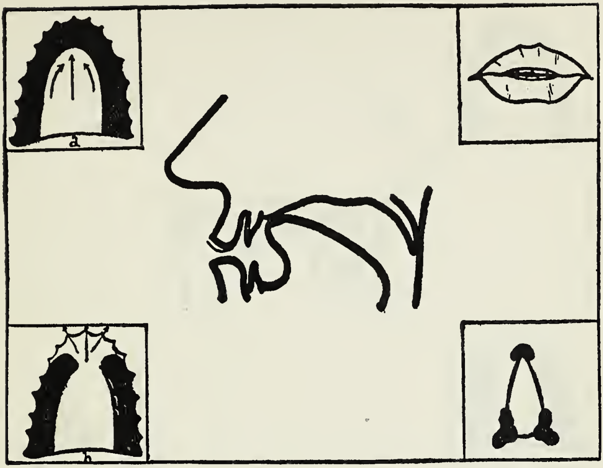
(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Arch the blade of the tongue and adjust it against the gum ridge of the upper teeth in a manner to form the wide articulatory aperture shown on the accompanying palatogram (fig. a).

(3) Thrust forward and slightly round the lips.

(4) Expel a current of *vocalized* breath.

## CH *as in* CHOKE




*Classification:*

Atonic distributed-plosive lingua-rugal CONSONANT.

*Production:*

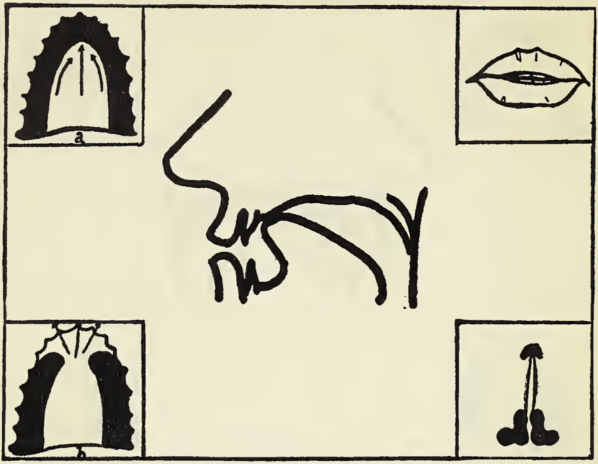
(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the blade of the tongue into air-tight occlusion with the gum ridge of the upper teeth.

(3) Permit a current of *unvocalized* breath to mount up in pressure behind this articulatory dam (fig. a).

(4) Depress the entire blade of the tongue suddenly, releasing the expired breath stream in a diffuse puff (fig. b).

## J *as in* JOKE



*Classification:*

Tonic distributed-plosive lingua-rugal CONSONANT.

*Production:*

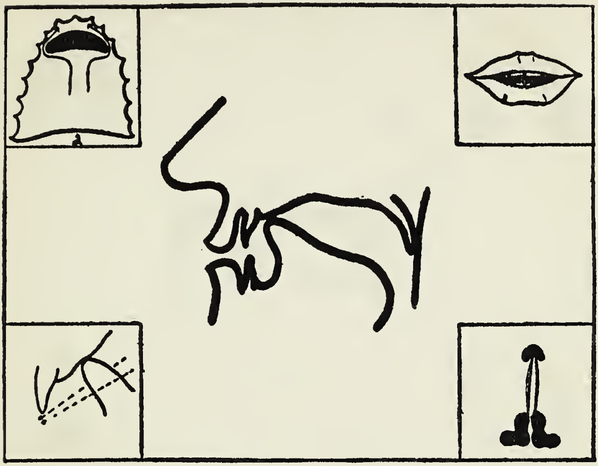
(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the blade of the tongue into air-tight occlusion with the gum ridge of the upper teeth.

(3) Permit a current of *vocalized* breath to mount up in pressure behind this articulatory dam (fig. a).

(4) Depress the entire blade of the tongue suddenly, releasing the expired breath stream in a diffuse puff (fig. b).

## L *as in* LAKE



*Classification:*

Tonic lateral-fricative lingua-rugal CONSONANT.

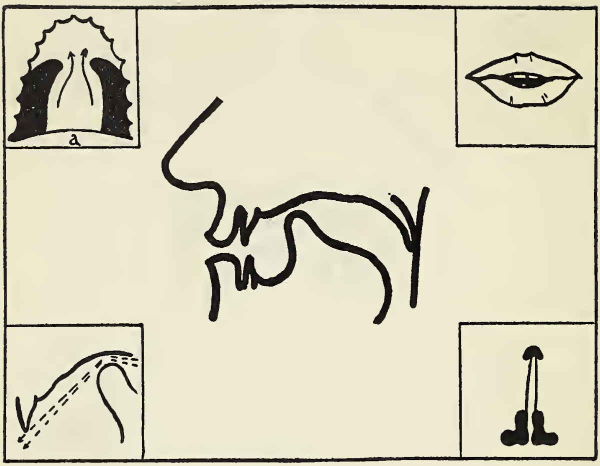
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the middle portion of the tongue tip into contact with the gum ridge of the upper teeth, taking care that the sides of the tongue do not participate in this contact. (See palatogram fig. a.)

(3) Expel a current of *vocalized* breath in such a manner that half of it passes to one side of the point of articulatory occlusion and half to the other side.

R *as in* ROAR




*Classification:*

Tonic distributed-fricative lingua-palatal CONSONANT.

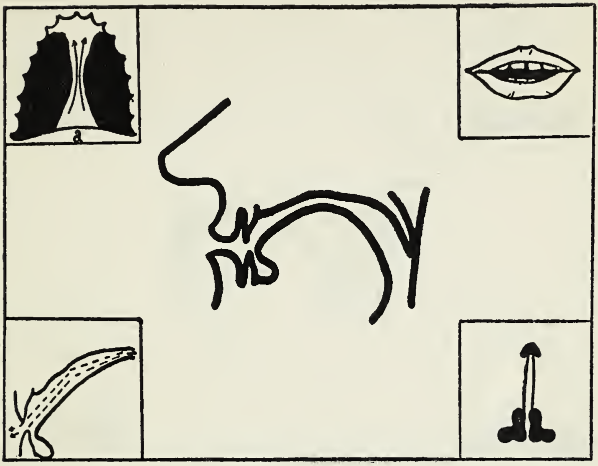
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the tip of the tongue towards the hard palate, inverting it slightly and adjusting it in a manner to form the relatively wide articulatory aperture shown on the accompanying palatogram (fig. a).

(3) Expel a current of *vocalized* breath thru this aperture.

## Y *as in* YOUR




*Classification:*

Tonic concentrated-fricative lingua-palatal CONSONANT.

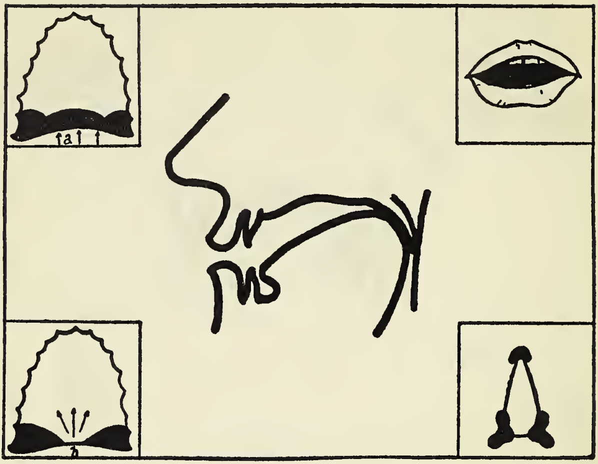
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Arch the blade of the tongue against the hard palate in a manner to form the relatively narrow articulatory aperture shown on the accompanying palatogram (fig. a).

(3) Expel a current of *vocalized* breath thru this aperture.

## K *as in* KATE




*Classification:*

Atonic concentrated-plosive lingua-velar CONSONANT.

*Production:*

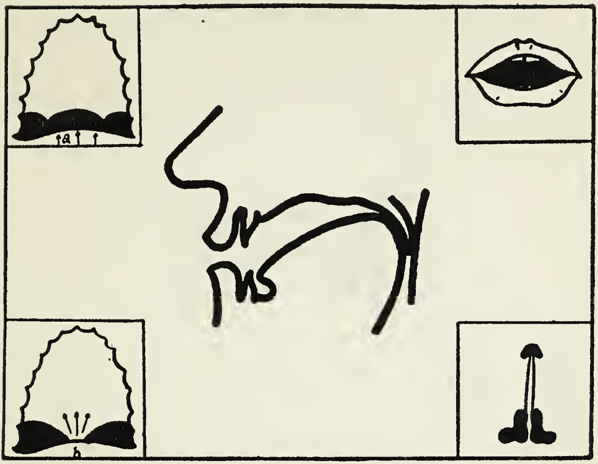
(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Raise the back of the tongue into air-tight occlusion with the soft palate.

(3) Permit a current of breath (*unvocalized*) to mount up in pressure behind this articulatory dam (fig. a).

(4) Depress suddenly the middle portion of the back of the tongue, releasing the expired breath stream in a concentrated puff (fig. b).

## G *as in* GATE



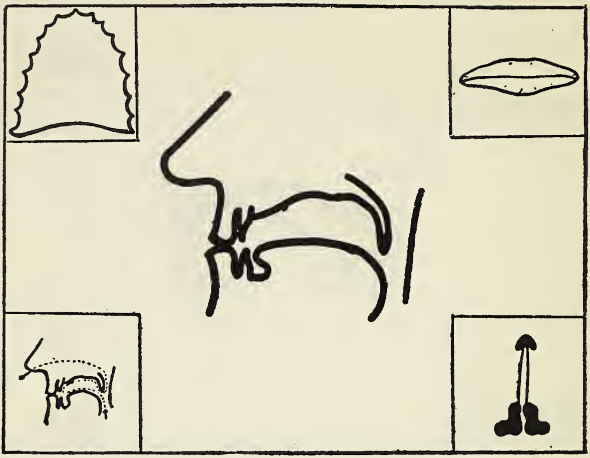

*Classification:*

Tonic concentrated-plosive lingua-velar CONSONANT.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.
(2) Raise the back of the tongue into air-tight occlusion with the soft palate.
(3) Permit a current of breath (*vocalized*) to mount up in pressure behind this articulatory dam (fig. a).
(4) Depress suddenly the middle portion of the back of the tongue, releasing the expired breath stream in a concentrated puff (fig. b).

M *as in* SLUM



*Classification:*

Bilabial NASAL RESONANT.

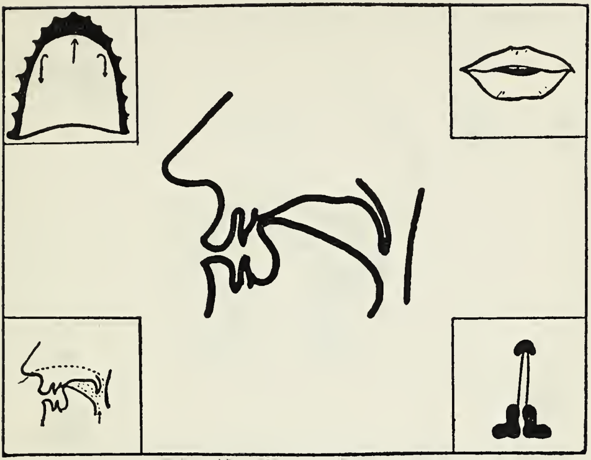
*Production:*

(1) Block the oral outlet of the respiratory tract by closure of the lips.

(2) Lower the soft palate.

(3) Throw the vocal chords into vibration with an expired breath current.

N *as in* STUN



*Classification:*

Lingua-rugal NASAL RESONANT.

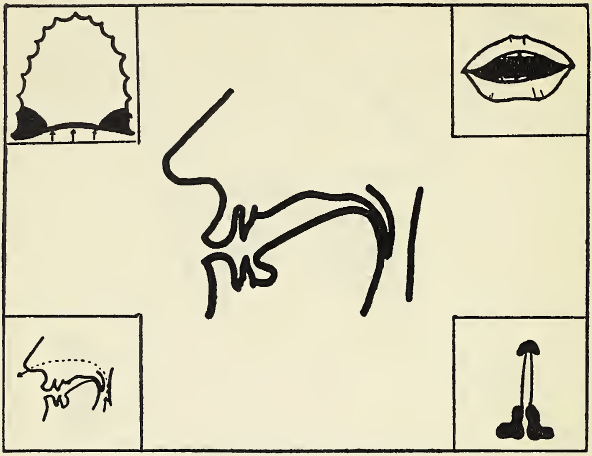
*Production:*

(1) Block the oral outlet of the respiratory tract by raising the tip of the tongue into air-tight occlusion with the gum ridge of the upper teeth.

(2) Lower the soft palate.

(3) Throw the vocal chords into vibration with an expired breath current.

## NG *as in* SUNG



*Classification:*

Lingua-velar NASAL RESONANT.

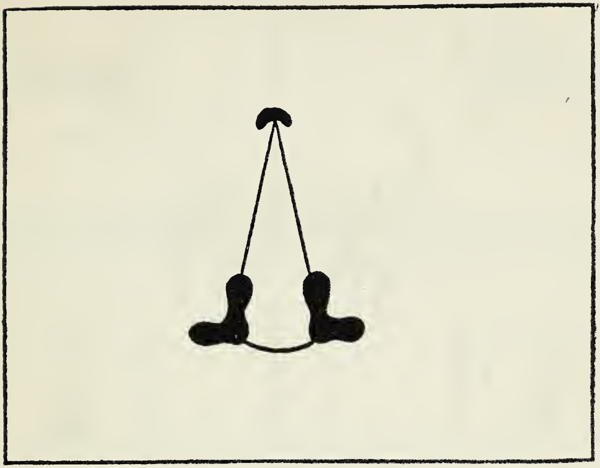
*Production:*

(1) Block the oral outlet of the respiratory tract by raising the back of the tongue into air-tight occlusion with the soft palate.

(2) Lower the soft palate.

(3) Throw the vocal chords into vibration with an expired breath current.

## H *as in* HAND



*Classification:*

GLOTTAL ASPIRATE.

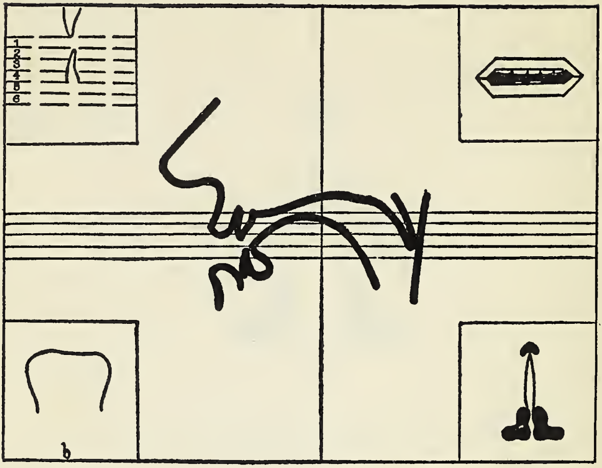
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Narrow the glottis just enough so that an expired breath current will cause audible friction in passing thru it (i. e., so that an air blade will be formed immediately above the glottal stricture) without throwing the vocal chords into vibration.[1]

[1] In connected speech H is quite frequently replaced by a devocalized vowel. Thus the first sound in the utterance HEAT is usually not a glottal aspirate at all but a devocalized E; similarly, the first sound in the utterance HOOT is often a devocalized OO; the first sound in the utterance HATE, a devocalized A; etc. These devocalized vowels are acoustically undifferentiable from the glottal aspirate for which they are substituted.

## E *as in* WEAL



*Classification:*

Front close convex unrounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

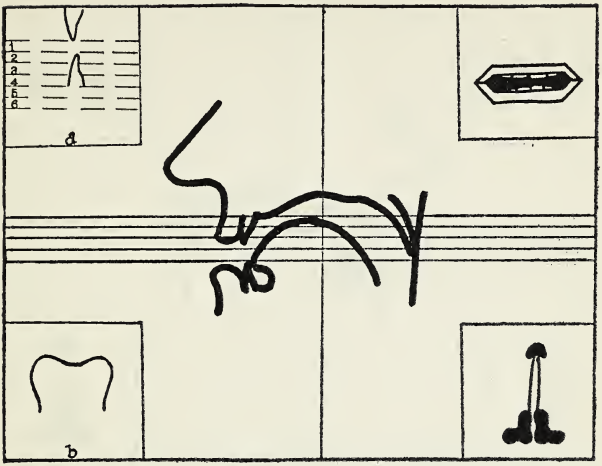
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of approximately an eighth of an inch. (This interval we shall designate as *ONE UNIT* and utilize as a basis for subsequent measurements.)

(3) Elevate the front of the tongue to a position as close to the hard palate as it can possibly take without giving rise to consonantal friction (i. e., without forming an air blade).

(4) Tense the tongue muscles so that the usual side-to-side concavity of the tongue is largely overcome.

(5) Throw the vocal chords into vibration with a current of expired breath.

I *as in* WILL




*Classification:*

Front close concave unrounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

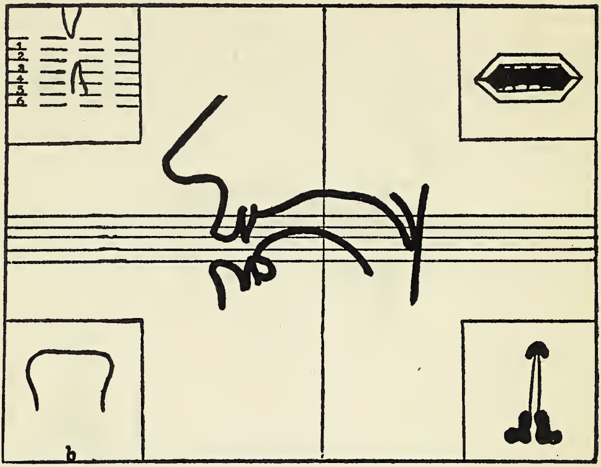
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of approximately one unit (fig. a).

(3) Elevate the front of the tongue to a position as close to the hard palate as it can possibly take without giving rise to consonantal friction (i. e., without forming an air blade).

(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity (fig. b).

(5) Throw the vocal chords into vibration with a current of expired breath.

## A *as in* LACE




*Classification:*

Front upper-intermediate convex unrounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by two units.

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*front upper-intermediate*).

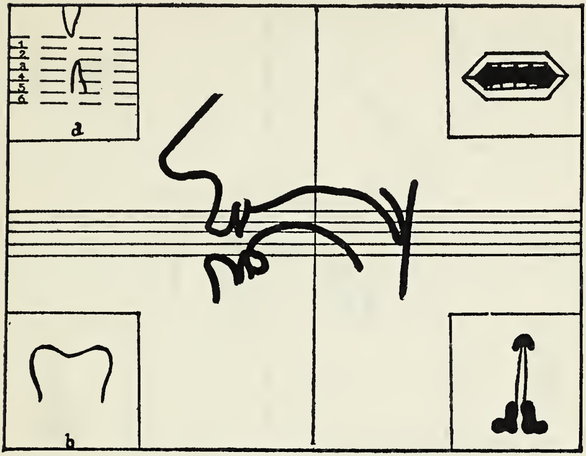
(4) Tense the tongue muscles so that the usual side-to-side concavity of the tongue is largely overcome (fig. b).

(5) Throw the vocal chords into vibration with a current of expired breath.

*Comment:*

This sound rarely occurs in connected English speech except as the first element of the diphthong AY *as in* PRAY.

## E *as in* LESS




*Classification:*

Front upper-intermediate concave unrounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

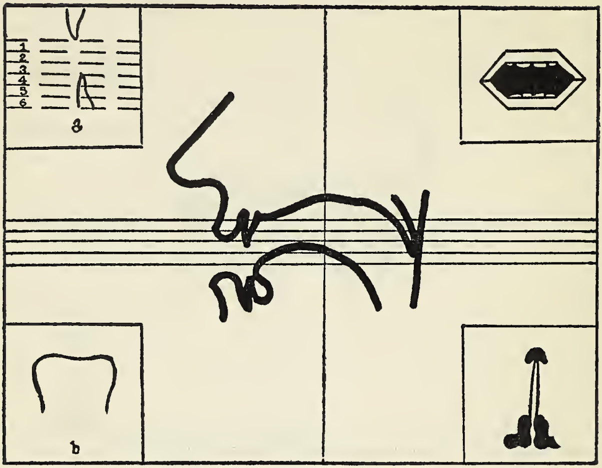
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of two units (fig. a).

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*front upper-intermediate*).

(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity (fig. b).

(5) Throw the vocal chords into vibration with a current of expired breath.

## A *as in* BARE




*Classification:*

Front lower-intermediate convex unrounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

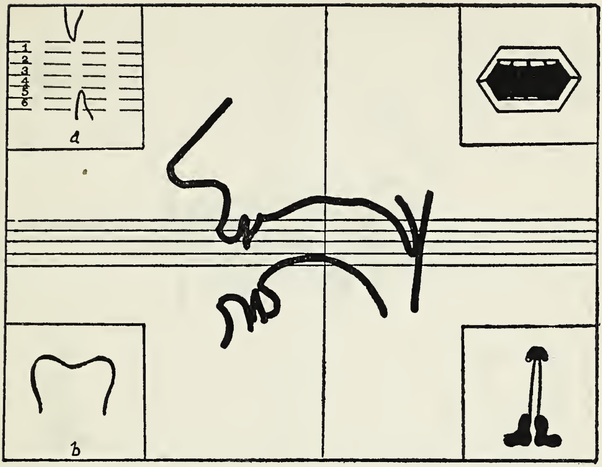
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of three units (fig. a).

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*front lower-intermediate*).

(4) Tense the tongue muscles so that the usual side-to-side concavity of the tongue is largely overcome (fig. b).

(5) Throw the vocal chords into vibration with a current of expired breath.

## A *as in* FLAT




*Classification:*

Front open concave unrounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

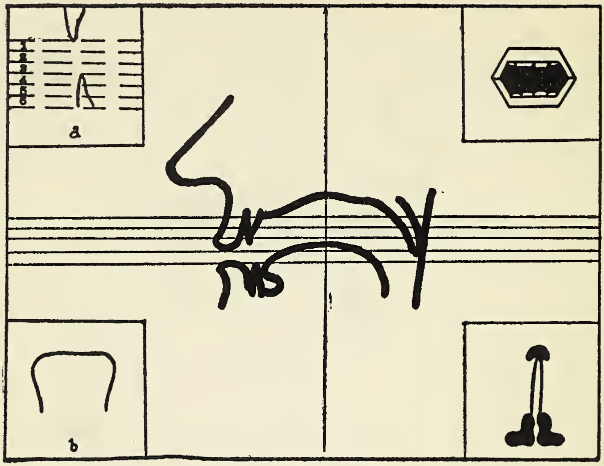
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of four units (fig. a).

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*front open*).

(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity (fig. b).

(5) Throw the vocal chords into vibration with a current of expired breath.

I *as in* BIRD




*Classification:*

Mixed lower-intermediate tense VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

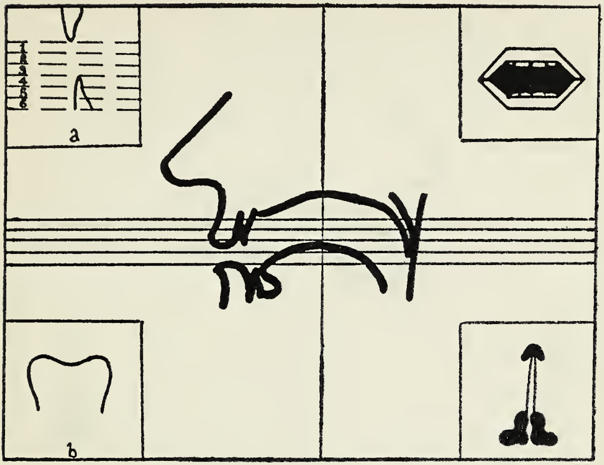
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of three units (fig. a).

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*mixed lower-intermediate*).

(4) Tense the tongue muscles so that the usual side-to-side concavity of the tongue is largely overcome (fig. b).

(5) Throw the vocal chords into vibration with a current of expired breath.

## A *as in* AMID




*Classification:*

Mixed lower-intermediate concave VOWEL.

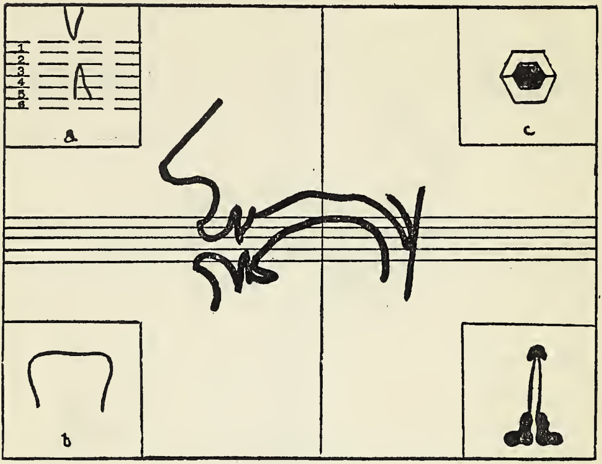
*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by three units
(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*mixed lower-intermediate*).
(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity.
(5) Throw the vocal chords into vibration with a current of expired breath.

*Comment:*

This sound occurs in unstressed syllables only. It may result from the stress reduction of almost any vowel.

## OO *as in* BOOT




*Classification:*

Back close convex rounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of two units (fig. a).

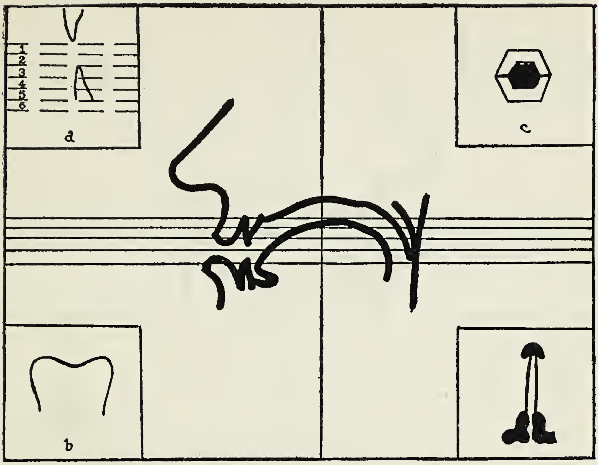
(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*back close*).

(4) Tense the tongue muscles so that the usual side-to-side concavity of the tongue is largely overcome (fig. b).

(5) Thrust forward and round the lips in a manner to form the resonance aperture shown in fig. c.

(6) Throw the vocal chords into vibration with a current of expired breath.

## OO *as in* BOOK




*Classification:*

Back close concave rounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of two units (fig. a).

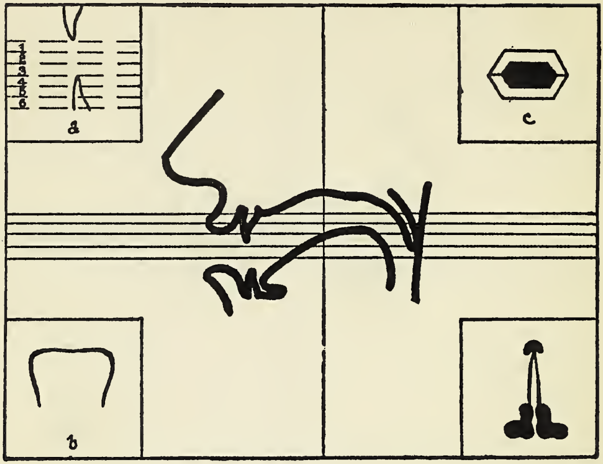
(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*back close*).

(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity (fig. b).

(5) Thrust forward and round the lips in a manner to form the resonance aperture shown in fig. c.

(6) Throw the vocal chords into vibration with a current of expired breath.

## O *as in* NOTE




*Classification:*

Back upper-intermediate convex rounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by three units.

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*back upper-intermediate*).

(4) Tense the tongue muscles so that the usual side-to-side concavity of the tongue is largely overcome.

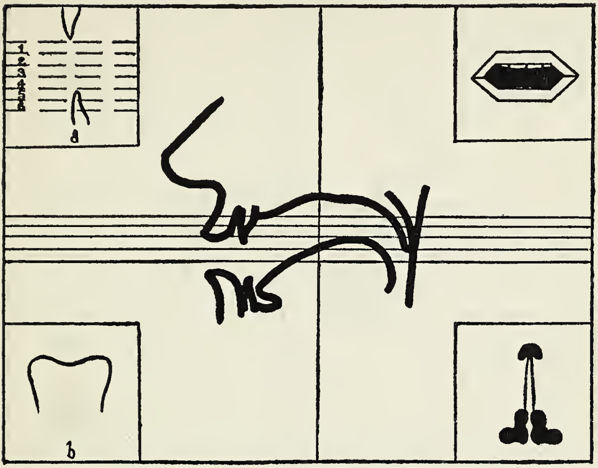
(5) Thrust forward and round the lips in a manner to form the resonance aperture shown in fig. c.

(6) Throw the vocal chords into vibration.

*Comment:*

This sound rarely occurs in connected English speech except as the first element of the diphthong OW *as in* BLOW.

U *as in* STUB




*Classification:*

Back lower-intermediate concave unrounded VOWEL.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

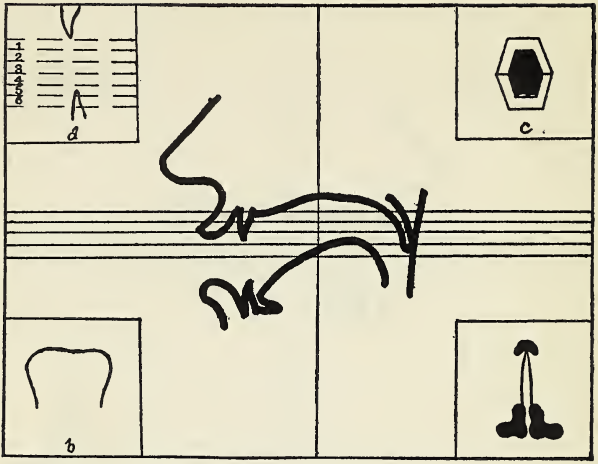
(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of four units (fig. a).

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*back lower-intermediate*).

(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity. (fig. b).

(5) Throw the vocal chords into vibration with a current of expired breath.

A *as in* FLAW




*Classification:*

Back lower-intermediate convex rounded.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Drop the lower jaw until the lower front teeth are separated from the upper by four and a half units.

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*back lower-intermediate*).[2]

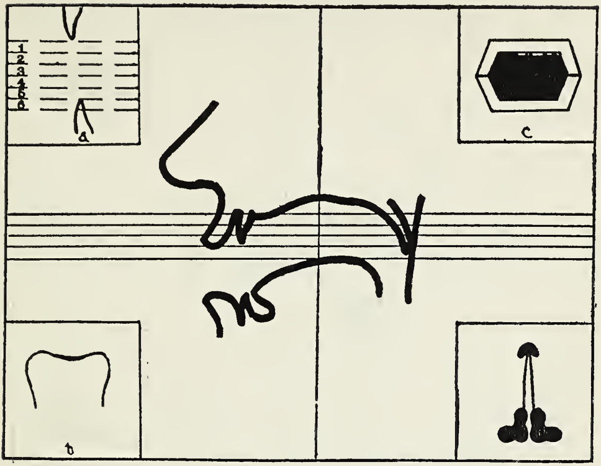
(4) Tense the tongue muscles so that the usual side-to-side concavity of the tongue is largely overcome.

(5) Thrust forward and round the lips in a manner to form the resonance aperture shown in fig. c.

(6) Throw the vocal chords into vibration.

[2] In this position the back of the tongue is a shade lower than in the position required for the production of U *as in* STUB.

## O *as in* STOP




*Classification:*

Back open concave rounded.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of five units.

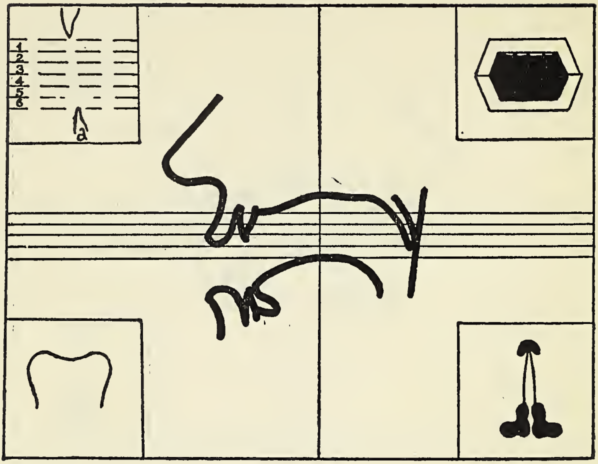
(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*back open*).

(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity.

(5) Thrust forward and round the lips (very slightly) in a manner to form the resonance aperture shown in fig. c.

(6) Throw the vocal chords into vibration with a current of expired breath.

A *as in* STAR




*Classification:*

Back open concave unrounded.

*Production:*

(1) Block the nasal outlet of the respiratory tract by raising the soft palate against the pharyngeal wall.

(2) Drop the lower jaw until the lower front teeth are separated from the upper front teeth by an interval of six units (fig. a).

(3) Adjust the tongue so that it assumes the position indicated by the accompanying diagram (*back open*).[3]

(4) Leave the tongue muscles lax so that the surface of the tongue retains its usual side-to-side concavity.

(5) Throw the vocal chords into vibration with a current of expired breath.

[3] In the production of this sound the rear of the tongue is not retracted as far as for the production of O *as in* STOP.

**Word Lists.** The following exercises illustrate the occurrence of each of the sound units of standard English speech in varied word positions.

WH *as in* WHAT

| | | | |
|---|---|---|---|
| *wheat* | *where* | *whip* | *white* |
| *which* | *while* | *whisper* | *whisk* |
| *when* | *whim* | *whirl* | *whittle* |

W *as in* WATT

| | | | |
|---|---|---|---|
| *wagon* | *away* | *weather* | *westward* |
| *weed* | *unwind* | *wash* | *wayward* |
| *willow* | *overwork* | *wardrobe* | *well* |

P *as in* POND

| | | | |
|---|---|---|---|
| *pocket* | *hopeful* | *pope* | *upkeep* |
| *prod* | *stipend* | *antelope* | *property* |
| *peach* | *hopper* | *scallop* | *appropriate* |

B *as in* BOND

| | | | |
|---|---|---|---|
| *boat* | *abound* | *confab* | *babble* |
| *blossom* | *inebriate* | *lobe* | *bamboo* |
| *blight* | *trouble* | *scribe* | *bibliophile* |

## F *as in* FINE

| | | | |
|---|---|---|---|
| *favor* | *coffee* | *knife* | *fructify* |
| *flagrant* | *ruffle* | *belief* | *fluffy* |
| *futile* | *deft* | *midriff* | *fortify* |

## V *as in* VINE

| | | | |
|---|---|---|---|
| *vague* | *movement* | *weave* | *revival* |
| *vessel* | *poverty* | *swerve* | *vivisection* |
| *valley* | *severance* | *shelve* | *revolve* |

## TH *as in* THIN

| | | | |
|---|---|---|---|
| *thistle* | *pathetic* | *wrath* | *pathotherapy* |
| *think* | *ethnic* | *breath* | *authority* |
| *thrift* | *pathway* | *faith* | *breadth* |

## TH *as in* THEN

| | | | |
|---|---|---|---|
| *therefor* | *lather* | *breathe* | *tether* |
| *thence* | *another* | *smooth* | *Thee* |
| *tho* | *whether* | *lathe* | *thence* |

## T *as in* TOWN

| | | | |
|---|---|---|---|
| *trunk* | *attack* | *prevent* | *tattoo* |
| *tack* | *fitting* | *accumulate* | *stopped* |
| *tread* | *attire* | *accost* | *statistics* |

## D *as in* DOWN

| | | | |
|---|---|---|---|
| *drouth* | *adage* | *preclude* | *addendum* |
| *dash* | *paddock* | *instead* | *disdained* |
| *double* | *peduncle* | *portrayed* | *diadem* |

### S *as in* SINK

| | | | |
|---|---|---|---|
| *savory* | *distend* | *enhance* | *suspects* |
| *soldier* | *customary* | *unlace* | *persists* |
| *seldom* | *muscle* | *amiss* | *scissel* |

### Z *as in* ZINK

| | | | |
|---|---|---|---|
| *zebra* | *nodules* | *nasal* | *possessions* |
| *zero* | *prayers* | *prison* | *diseases* |
| *Zouave* | *appraisal* | *studies* | *houses* |

### SH *as in* ASSURE

| | | | |
|---|---|---|---|
| *should* | *ashes* | *thrush* | *shellfish* |
| *shingle* | *assure* | *admonish* | *sheepish* |
| *shallow* | *cashier* | *flash* | *shipshape* |

### ZH *as in* AZURE

| | | | |
|---|---|---|---|
| *azure* | *adhesion* | *invasion* | *revision* |
| *pleasure* | *decision* | *derision* | *Elysian* |
| *division* | *measure* | *Persia* | *precision* |

### CH *as in* CHOKE

| | | | |
|---|---|---|---|
| *chuckle* | *preacher* | *staunch* | *chaffinch* |
| *chest* | *scorching* | *besmirch* | *chain-stitch* |
| *chariot* | *voucher* | *Greenwich* | *churchman* |

### J *as in* JOKE

| | | | |
|---|---|---|---|
| *jovial* | *prejudice* | *bridge* | *genealogy* |
| *junior* | *stranger* | *carriage* | *ginger* |
| *justify* | *religious* | *college* | *adjudgment* |

### L *as in* LAKE

| | | | |
|---|---|---|---|
| *laugh* | *elevator* | *annual* | *linoleum* |
| *letter* | *emulate* | *avail* | *lintel* |
| *luster* | *illusion* | *trouble* | *lenticularly* |

### R *as in* ROAR

| | | | |
|---|---|---|---|
| *ruthless* | *erroneous* | *dinosaur* | *rupture* |
| *reminiscent* | *heliotrope* | *vampire* | *rarer* |
| *rainbow* | *moral* | *denture* | *hypertrophy* |

### Y *as in* YOUR

| | | | |
|---|---|---|---|
| *yesterday* | *reunion* | *yellow* | *usury* |
| *yearning* | *unyielding* | *Yale* | *cucullate* |
| *yeast* | *unused* | *yarn* | *uvula* |

### K *as in* KATE

| | | | |
|---|---|---|---|
| *crystal* | *package* | *rebuke* | *cricket* |
| *chemistry* | *accuse* | *limerick* | *cacophony* |
| *chorus* | *rectify* | *brake* | *concave* |

### G *as in* GATE

| | | | |
|---|---|---|---|
| *galaxy* | *agate* | *brogue* | *eggnog* |
| *garnish* | *aghast* | *epilogue* | *aggregate* |
| *glacier* | *stagger* | *fog* | *egregious* |

### M *as in* SLUM

| | | | |
|---|---|---|---|
| *manuscript* | *ramrod* | *program* | *memorandum* |
| *minute* | *umbrella* | *pantomime* | *metamorphism* |
| *manacle* | *amorous* | *shame* | *microcosm* |

## N *as in* STUN

| | | | |
|---|---|---|---|
| *notion* | *rendered* | *spawn* | *neptunian* |
| *novelty* | *interim* | *colon* | *nonchalance* |
| *narrow* | *promenade* | *lemon* | *nonagenarian* |

## NG *as in* SUNG

| | | | |
|---|---|---|---|
| *inkwell* | *wringer* | *spring* | *inkling* |
| *think* | *shanghai* | *among* | *winging* |
| *incubus* | *tingle* | *wrung* | *banging* |

## H *as in* HAND

| | | | |
|---|---|---|---|
| *herald* | *unhand* | *hysterical* | *hardihood* |
| *hemp* | *unwholesome* | *preheated* | *hedgehog* |
| *horrible* | *inhabit* | *hogshead* | *hard-hearted* |

## E *as in* WEAL

| | | | |
|---|---|---|---|
| *eat* | *scheme* | *knee* | *decrease* |
| *ease* | *weak* | *debris* | *precede* |
| *equally* | *meter* | *fee* | *geography* |

## I *as in* WILL

| | | | |
|---|---|---|---|
| *instance* | *biscuit* | *commit* | *principle* |
| *ill* | *minute* | *prohibit* | *strychnine* |
| *imminent* | *women* | *transition* | *interim* |

## A *as in* LACE

| | | | |
|---|---|---|---|
| *able* | *surveyor* | *roundelay* | *pay-day* |
| *amiable* | *champagne* | *fray* | *satiate* |
| *ailment* | *traitor* | *sleigh* | *papaveraceous* |

### E *as in* LESS

| | | | |
|---|---|---|---|
| *enterprise* | *amend* | *pretend* | *effervescence* |
| *effort* | *meadow* | *tension* | *eminence* |
| *any* | *tremendous* | *levity* | *emblem* |

### A *as in* BARE

| | | | |
|---|---|---|---|
| *heirloom* | *prayer* | *daring* | *vegetarian* |
| *airplane* | *fairest* | *snare* | *where e'er* |
| *aerate* | *chair* | *pair* | *unbearable* |

### A *as in* FLAT

| | | | |
|---|---|---|---|
| *applicable* | *laughter* | *understand* | *actuality* |
| *after* | *guarantee* | *pasture* | *practicality* |
| *adulation* | *matter* | *character* | *axiomatic* |

### I *as in* BIRD

| | | | |
|---|---|---|---|
| *earthly* | *eternal* | *furtive* | *perturbed* |
| *urn* | *fertile* | *terminate* | *further* |
| *erstwhile* | *servant* | *scourge* | *perverse* |

### A *as in* AMID

| | | | |
|---|---|---|---|
| *away* | *constable* | *caravan* | *nevertheless* |
| *about* | *treacherous* | *opportunity* | *discouragement* |
| *around* | *economy* | *clever* | *diphtheria* |

### OO *as in* BOOT

| | | | |
|---|---|---|---|
| *ooze* | *choose* | *knew* | *suffruticose* |
| *rule* | *crucial* | *too* | *rooted* |
| *tool* | *truant* | *who* | *soothsayer* |

### OO *as in* BOOK

| | | | |
|---|---|---|---|
| *should* | *ambush* | *bullet* | *wolfish* |
| *crooked* | *stood* | *pulley* | *couldn't* |
| *woman* | *pulmotor* | *pulpit* | *hooded* |

### O *as in* NOTE

| | | | |
|---|---|---|---|
| *open* | *protocol* | *motto* | *proponent* |
| *odor* | *broken* | *grotto* | *prototype* |
| *over* | *notation* | *solo* | *photograph* |

### U *as in* STUB

| | | | |
|---|---|---|---|
| *understood* | *shutter* | *money* | *unpublished* |
| *upper* | *sluggard* | *puddle* | *unblushing* |
| *ultimate* | *rudder* | *hush* | *uncomfortable* |

### A *as in* FLAW

| | | | |
|---|---|---|---|
| *awl* | *caught* | *foresaw* | *authority* |
| *order* | *portray* | *macaw* | *auditory* |
| *awe* | *frost* | *Shaw* | *laudatory* |

### O *as in* STOP

| | | | |
|---|---|---|---|
| *opportunity* | *totter* | *pedagogue* | *odontology* |
| *odd* | *dominate* | *hospital* | *monstrosity* |
| *honest* | *policy* | *ponderous* | *osteopathy* |

### A *as in* STAR

| | | | |
|---|---|---|---|
| *archive* | *father* | *bazaar* | *card-sharper* |
| *arctic* | *guard* | *handcar* | *large-hearted* |
| *arsenic* | *farce* | *catarrh* | *archæology* |

# CHAPTER IV

## *SPEECH DEFECTS*

**Definition.** A speech defect may be defined as any acoustic variation from an accepted speech standard so extreme as to be (a) *conspicuous,* (b) *confusing* or (c) *unpleasant.*[1] Such a variation may involve:

(1) *Defective Tone Quality*

EXAMPLES: nasal tone quality, harsh tone quality, muffled tone quality, graty tone quality, etc.

(2) *Defective Intonation*

EXAMPLES: mechanically recurrent falling inflection, mechanically recurrent rising inflection, monotone, etc.

(3) *Defective Breath Grouping*

EXAMPLES: What shall we (*pause*) do shall we (*pause*) go out for (*pause*) a walk or shall we stay at home?

[1] Acoustic variations from accepted speech standards which are not conspicuous, confusing or unpleasant will be considered in the present work as permissible indications of a to-be-expected tendency on the part of every individual and of every group of individuals to vary somewhat from the theoretical norm. As has been pointed out in the previous chapter there is, strictly speaking, no such thing as *standard speech*—unless we interpret the term broadly and intelligently, allowing latitude for a reasonable amount of individual and regional variation.

*for*

What shall we do? (*pause*) Shall we go out for a walk? (*pause*) Or shall we stay at home?

What'sthemattersomebodyhurtwhat'shappened?

*for*

What's the matter? (*pause*) Somebody hurt? (*pause*) What's happened?

(4) *Defective Stress Placement*

EXAMPLES: or-ches′–tra *for* or′-ches-tra, pres-i-dent′ *for* pres′-i-dent, car′-ess *for* ca-ress′, etc.

(5) *Stammering*

EXAMPLES: pathologic retardations in the utterance of sound units, pathologic accelerations in the utterance of sound units, pathologic prolongations in the utterance of sound units, pathologic repetitions in the utterance of sound units, etc.

(6) *Aphonia* [2]

(7) *The Inversion of Properly Occurring Sound Unit Sequences*

EXAMPLES: lantren *for* lantern, hunderd *for* hundred, preform *for* perform, etc.

(8) *The Omission of Sound Units from Positions in Which They Properly Occur*

EXAMPLES: cap'n *for* captain, hist'ry for history, 'ittle *for* little, Ca'lina *for* Carolina, etc.

(9) *The Insertion of Sound Units into Positions in Which They Do not Properly Occur*

EXAMPLES: athalete *for* athlete, idear *for* idea, filum *for* film, Henglish *for* English, etc.

[2] Loss of voice.

(10) *The Replacement of Properly Occurring Sound Units by Other Sound Units Slightly or Totally Different*

EXAMPLES: dis *for* this, heem *for* him, vat *for* what, het *for* hat, etc.

**Causation and Classification.** According to the nature of the factors involved in their causation, speech defects may be divided into six major classifications.

(1) *Organic Speech Defects.* Many speech defects are caused by pathologic changes in the actual structure of the speech mechanism. Nasality, for example, is frequently caused by inflammation of the mucous membrane lining the walls of the nasal cavity; hoarseness by nodular growths on the inner edges of the vocal chords; aphonia by laryngeal paralysis; certain erroneous sound unit substitutions by tongue-tie; other erroneous sound unit substitutions by cleft palate; still other erroneous sound unit substitutions by hare-lip; etc., etc. All speech defects which have their origin in a malformation, disease or trauma of the speech mechanism may be conveniently grouped under the general heading ORGANIC DEFECTS.

(2) *Defects of Foreign Dialect.* Many speech defects are caused, not by structural inadequacy of the speech mechanism, but as the result of difficulties encountered in the acoustic transition from one language to another. The German-American who asks, *"Vot iss?"*—the Italian-American who replies, *"Eet ees heem!"*—the Swedish-American who *"bane hard vorking faller"*—the French-American who talks of *"ziss and zat"*—the Chinese-American who *"luns a laundly"* and the Ameri-

canized Russian-Jew who is in the *"clodingk pissness"*—all have failed to make a satisfactory transition from their native tongues to English. All speech defects which occur as symptoms of an imperfect acoustic transition from one language to another may be grouped under the general heading DEFECTS OF FOREIGN DIALECT.

(3) *Defects of Provincial Dialect.* Many speech defects are products of eccentric language developments occurring within our own national boundaries, usually within communities cut off by economic, geographic, racial or religious barriers from the main stream of national life. The Kentucky mountaineer, geographically as well as economically isolated from his fellow Americans, has developed a speech so radically at variance with national speech standards that visitors find oral communication with him extremely difficult. Similarly the native New Yorker who has never travelled further than *"Joisey"* and who confines his reading to *"De Noo Yawk Woild 'n Joinal"* has developed his own peculiar speech, differing markedly in many of its sound components from the standard speech of the nation. The same is true of the packing-house worker of Chicago, the Texas rancher, the Pittsburgh foundry worker, the Georgia darky, the Pennsylvania "Dutchman," the West Virginia coal miner, the New England farmer and the New York "up-stater." All speech defects which occur as symptoms of eccentric language developments within a given nation's borders may be conveniently classified under the general heading DEFECTS OF PROVINCIAL DIALECT.

(4) *Defects of Carelessness.* Many of our most common speech defects arise from ordinary carelessness. The individual who says *"Wozzis?"* for *"What's this?"*

is motivated in his defective utterance by plain lingual laziness. It is, physiologically speaking, a little easier for him in voicing his request to change an S into a Z—and to skip over a sound unit or two completely—so he does it. For the same reason he refers to *"Wotzisname"* or to *"Watch'm'callit"*; says *"wits"* for *"widths," "gen'l'men"* for *"gentlemen," "unnerstand"* for *"understand"* and regularly eliminates, wherever convenient, sound units, syllables and even whole words. All speech defects prompted by lingual laziness may be conveniently classified under the general heading DEFECTS OF CARELESSNESS.

(5) *Defects of Infantile Perseveration.* A surprisingly large number of speech defects are merely perseverations of infantile speech habits. When Johnny Jones, aged four, cries for his *"muvver"* or calls for his *"'ittle titty tat,"* no one considers anything amiss with his speech since young children universally and quite naturally express themselves in this imperfect manner. But if Johnny Jones, aged ten, employs the same expressions his speech must be considered defective. Only very young children indeed should be permitted to play with *"titty tats,"* get pains in their *"tummies"* and ride on *"twolley tars."* Any expressions of this character which persist beyond the years normally allotted to *infancy* (1–6) may be properly considered as speech defects and classified under the general heading DEFECTS OF INFANTILE PERSEVERATION.

(6) *Neurotic Defects.* Many speech defects occur as symptoms of a functional nervous disturbance. The stutterer who declares that he *"g-g-g-gets p-p-p-panicky"* when he is called upon to speak and consequently

*"c-c-c-can't sssssay any-any-any-anythththing"* is in all probability suffering from unconscious psychic conflicts, the pathologic nature of which is made manifest not only by his speech defects but by a hundred other nervous symptoms ranging from facial and bodily contortions, blushing and general embarrassment to phobias, obsessions and compulsive acts. All speech defects caused by a functional nervous disturbance may be conveniently classified under the general heading NEUROTIC DEFECTS.

**Diagnosis.** Every case of defective speech must be carefully diagnosed before corrective measures can be prescribed. The process of diagnosis involves three distinct and equally important steps:

(1) the auditory detection of all defects in the patient's speech

(2) the arrangement of these defects in convenient groups according to immediately discernible acoustic and physiologic relationships

(3) the classification of these defects according to cause.

(*1*) *Detecting the Patient's Defects.* The first of these steps, that of defect detection, is anything but simple.

The instructor should begin by testing the patient's ability to produce accurately each of the 40 sound units and 5 diphthongs of standard English speech. For the purpose of this test the patient should be asked to read a series of specially constructed paragraphs. Each of the following paragraphs is constructed so as to emphasize, thru frequency of occurrence, some one sound unit or diphthong.

WH *as in* WHAT

Think of three things: what you are—whence you came—whither you are going!

W *as in* WATT

A woman's wit is often so weighted with wisdom that laughter is hushed in wonder.

P *as in* POND

The painter, the sculptor, the epic rhapsodist, the orator—all partake of one desire, namely, to express themselves symmetrically and abundantly, not pettily and fragmentarily.

B *as in* BOND

Be brief—but in laboring to be brief take care that you do not become obscure.

F *as in* FINE

The free man is he who has the fortitude to take life as he finds it—feast or famine.

V *as in* VINE

A little cleverness may often evade resistance which a vast force might vainly strive to overcome.

TH *as in* THIN

What a man thinks a thing is worth, that is its true value—for nothing exists except within the world of thought.

TH *as in* THEN

Words are, like money, a medium of exchange and the sureness with which they can be used varies not only with the character of the coins themselves but also with the nature of the thing they buy and that of the men who tender and receive them.

T *as in* TOWN

Tricks and treachery are the practise of fools who have not wit enough to be honest.

D *as in* DOWN

Words and deeds are not essentially dissimilar: words may be considered as actions and actions as a kind of words.

S *as in* SINK

Science represents the homage of man to the unfathomed

secrets of life and death, concerning which no one can affect indifference or incuriosity.

Z *as in* ZINC

It is with geniuses as with flowers; the brightest are sometimes the most poisonous.

SH *as in* ASSURE

The consciousness of subjection to human law is the mind's definition of oppression; the consciousness of subjection to divine law is the spirit's definition of liberation.

ZH *as in* AZURE

Illusions are the rainbows of life at the foot of which we find, not treasure, but—disillusion!

CH *as in* CHOKE

If you would attain the riches of inward peace, imitate the child in these things: humility, charity and cheerfulness.

J *as in* JOKE

Such are the prejudices of our age that the man of genius, particularly the man of original genius, generally finds himself without patronage.

L *as in* LAKE

As a commonplace personality can seldom become cosmopolitan, so an original personality can seldom become wholly provincial.

R *as in* ROAR

So much of our time is preparation, so much is routine and so much is retrospect that the pith of each man's genius contracts itself to a very few hours.

Y *as in* YOUR

Peer not ahead into the obscurity of your future nor behind into the oblivion of your past—but about you at the actualities of your present!

K *as in* KATE

Experience is like a keen knife that hurts while it extracts the cataract that blinds.

G *as in* GATE

The ascetic who regards the earth as degrading, who ig-

nores it and slanders it, who gloats on its gloom and forgets its loveliness, deserves little credit for his languid perception of brightness in heaven.

M *as in* SLUM

Criticism is infested with a cant of materialism which assumes that manual skill is the most important merit that a man may possess.

N *as in* STUN

The man of cold nature and superior intellect sneers at nothing so bitterly as at a magnanimity of which he knows himself incapable.

NG *as in* SUNG

The object of true upbringing lies not in merely inducing men to do good things but in enabling them to find joy in doing them.

H *as in* HAND

Who is wise? He who is willing to learn from the most humble. Who is powerful? He who can govern his own passions. Who is rich? He who is content.

E *as in* WEAL

He who seeks power with the same zeal that he seeks peace finds neither.

I *as in* WILL

Revolution and reaction have been the twin ills which have afflicted civilization since the beginning of its history.

A *as in* LACE

Religions may change from day to day, pulpits may shake, rituals and creeds decay—the science of ethics remains immutable.

E *as in* LESS

Some men resent all progress so intensely that they can never bring themselves to relish the new moon out of respect for that venerable institution, the old one.

A *as in* BARE

The fairest are rarely the wisest; the most careful are seldom the most able. Nature, lavish in most matters, seems to have been sparing in her allotment of virtues.

A *as in* FLAT

Scientific realism recognizes the most intangible as well as the most palpable; it demands reality, yet it understands that reality is infinitely varied; it seeks truth, knowing that truth manifests itself in countless ways.

OO *as in* BOOT

"The exception proves the rule" is a maxim which has been greatly abused. What is usually true is that the exception proves the rule to be a bad one, to be deduced negligently and hastily from inadequate premises or to have overreached itself.

OO *as in* BOOK

The world is full of fools and he who would avoid looking upon one must first immure himself in his study—then break his own looking-glass!

O *as in* NOTE

A statesman, we are told, should follow public opinion. Perhaps so—but only as a coachman follows his horses, having firm hold on the reins and knowing the best way to go.

U *as in* STUB

Too much is seldom enough; pumping after your bucket is full prevents its keeping so.

A *as in* FLAW

The faultiness of man's law as contrasted with the flawlessness of divine law is perhaps best brought out by this fact: whereas we may reach the highest standard set before us by the former, the more we advance in striving to fulfill the latter the higher its standard keeps on rising above us.

O *as in* STOP

Be tolerant of the quarrelsomeness of the stupid. It is not easy to comprehend that one does not comprehend.

A *as in* STAR

We are all marching in a universal darkness towards a far goal—in our hearts the urge of hope—above, one lone star of faith.

I *as in* BIRD

The person who asserts his faith thru earnest, persevering and determined conduct does more to further that faith than he who extols it, however persuasively, in mere words.

A *as in* AMID

A wise philosopher has said: "Genius is merely the capacity for taking infinite pains." Similarly, inspiration is merely the ability to draw accurate inferences from the commonplace phenomena of life.

OU *as in* LOUD

How few are our real wants—and how easy to satisfy them! Only our imaginary ones are boundless and insatiable.

OI *as in* BOIL

Let us rejoice while we may, for from the very chalices of our joys we drain the swift poison of satiation.

IE *as in* PIE

Discipline, like the bridle in the hand of a good rider, should exercise its influence without appearing to do so, being held ever ready to check or pull up as occasion may require, yet lying easily in the hand.

AY *as in* PLAY

When silly folk take pains to conceal a secret from us, we shall certainly learn what it is, strive as we may to escape the knowledge.

OW *as in* FLOW

In the poet the emotions pay no toll to the intellect but rush out unbidden and uncontrollable from the hidden depths of the soul.

As the patient reads these paragraphs, the instructor should listen carefully, focusing his attention upon but one speech sound at a time in the order indicated by the marginal markings. The moment the instructor notes that a sound unit he is concentrating upon is being erroneously produced, he should indicate the fact by a

check to the left of the paragraph devoted to the emphasis of that sound—making no attempt at the time to determine the acoustic nature of the defect. Later the instructor should carefully confirm his first quick judgments and note the exact acoustic character of each defect. This he can best accomplish by having the patient either reread certain paragraphs of the original selection or run thru selected word lists. (See word lists pp. 119–125.) The findings of this phase of the diagnosis should be then embodied in a written memorandum for future reference. A convenient form for such a memorandum is suggested below:

*Form 1*

Patient's Name....................................
Instructor ....................................
Date ....................................

| SPEECH SOUND | COMMENT | SPEECH SOUND | COMMENT |
|---|---|---|---|
| WH *as in* WHAT | ........ | NG *as in* SUNG | ........ |
| W *as in* WATT | ........ | H *as in* HAND | ........ |
| P *as in* POND | ........ | E *as in* WEAL | ........ |
| B *as in* BOND | ........ | I *as in* WILL | ........ |
| F *as in* FINE | ........ | A *as in* LACE | ........ |
| V *as in* VINE | ........ | E *as in* LESS | ........ |
| TH *as in* THIN | ........ | A *as in* BARE | ........ |
| TH *as in* THEN | ........ | A *as in* FLAT | ........ |
| T *as in* TOWN | ........ | OO *as in* BOOT | ........ |
| D *as in* DOWN | ........ | OO *as in* BOOK | ........ |
| S *as in* SINK | ........ | O *as in* NOTE | ........ |
| Z *as in* ZINC | ........ | U *as in* STUB | ........ |
| SH *as in* ASSURE | ........ | A *as in* FLAW | ........ |
| ZH *as in* AZURE | ........ | O *as in* STOP | ........ |
| CH *as in* CHOKE | ........ | A *as in* STAR | ........ |

| SPEECH SOUND | COMMENT | SPEECH SOUND | COMMENT |
|---|---|---|---|
| J *as in* JOKE | ........ | I *as in* BIRD | ........ |
| L *as in* LAKE | ........ | A *as in* AMID | ........ |
| R *as in* ROAR | ........ | OU *as in* LOUD | ........ |
| Y *as in* YOUR | ........ | OI *as in* BOIL | ........ |
| K *as in* KATE | ........ | IE *as in* PILE | ........ |
| G *as in* GATE | ........ | AY *as in* PLAY | ........ |
| M *as in* SLUM | ........ | OW *as in* FLOW | ........ |
| N *as in* STUN | ........ | | |

Having checked up on his patient's ability to produce accurately each of the forty sound units and the five diphthongs of standard English speech, the instructor should next test for defective tone quality, general indistinctness, defective intonation, defective breath grouping, defective stress placement, pathologic retardations in the utterance of sound units, pathologic accelerations in the utterance of sound units, pathologic prolongations in the utterance of sound units, pathologic repetitions in the utterance of sound units, inversions of properly occurring sound unit sequences, erroneous sound unit omissions, erroneous sound unit additions and erroneous sound unit substitutions.[3]

For the purpose of this second test the patient should be requested to read another series of specially selected paragraphs.

[3] Since every defect noted on the preceding chart will fall under one of two heads—sound unit omissions or sound unit substitutions—the question may be asked: Why conduct further examinations for sound unit omissions and substitutions? The apparent overlapping of tests here is due to the fact that defects of sound unit omission and substitution are frequently SPORADIC rather than REGULAR —i. e., the patient may omit a given sound unit, or replace it by another, *only in certain acoustic contexts.* Such a sporadically occurring defect might not show up during the reading of a brief test sentence. Hence the need of supplementary, more exhaustive tests.

*Defective Tone Quality*

Few people, comparatively, have ever seen the effect on the sea of a powerful gale continued without intermission for three or four days and nights. To those who have not, I believe it must be unimaginable, not from the mere force or size of surge, but from the complete annihilation of the limit between sea and air. The water, from its prolonged aggravation, is beaten, not into mere creaming foam, but into masses of accumulated yeast, which hangs in ropes and wreaths from wave to wave, and where one curls over to break, forms a festoon like a drapery, from its edge. These are taken up by the wind, not in dissipating dust, but bodily, in writhing, hanging, coiling masses, which make the air white and thick as with snow.

*General Indistinctness*

If in our moments of utter idleness and insipidity, we turn to the sky as a last resource, which of its phenomena do we speak of? One says that it has been wet, and another it has been windy, and another it has been warm. Who, among the whole chattering crowd, can tell me of the forms and the precipices of the chain of tall white cloud-mountains that girded the horizon at noon yesterday? Who saw the narrow sunbeam that came out of the south and smote upon their summits until they melted and moldered away in a dust of blue rain? Who saw the dance of the dead clouds when the sunlight left them last night, and the west wind blew them before it like withered leaves? All has passed, unregretted and unseen.

*Defective Intonation*

Ascertain clearly what is wrong with you; and so far as you know any means of mending it, take those means and have done. When you are examining yourself never call yourself merely a "sinner"; that is a very cheap abuse and utterly useless. You may even get to like it, and be proud of it. But call yourself a liar, a coward, a sluggard, a glutton or an evil-eyed, jealous wretch, if

you indeed find yourself to be in any wise one of these. Take steady means to check yourself in whatever fault you have ascertained, and justly accused yourself of, and as soon as you are in active way of mending, you will be no more inclined to moan over an undefined corruption. For the rest, you will find it less easy to uproot faults, than to choke them by gaining virtues.

*Defective Breath Grouping*

There is an exquisite sensibility among the leaves of a tree. They do not grow each to its own liking, till they run against one another, and then turn back sulkily; but by a watchful instinct, far apart, they anticipate their companions' courses, as ships at sea, and in every new unfolding of their edged tissues, guide themselves by the sense of each other's remote presence and by a watchful penetration of leafy purpose in the far future.

*Defective Stress Placement*

The entire object of true education is to make people not merely do the right things, but enjoy the right things—not merely industrious, but to love industry—not merely learned, but to love knowledge—not merely pure, but to love purity—not merely just, but to hunger and thirst after justice. We should therefore teach our children reverence and compassion, and with these, as the bond and guardian of them, truth of spirit—truth, earnest and passionate, sought for like a treasure and kept like a crown.

*Pathologic Retardations*

A cat may look at a king;—yes, but can it *see* a king when it looks at him? The beasts of prey never seem to me to *look,* in our sense, at all. Their eyes are fascinated by the motion of anything, as a kitten's by a ball: they fasten, as if drawn by an inevitable attraction, on their food. But when a cat caresses you, it never looks at you. Its heart seems to be in its back and paws, not its eyes.

*Pathologic Prolongations*

How false is the conception, how frantic the pursuit, of that treacherous phantom which men call Liberty—most treacherous, indeed, of all phantoms; for the feeblest ray of reason might surely show us that not only its attainment but its *being* was impossible. There is no such thing in the universe. There can never be. The stars have it not; the earth has it not; the sea has it not; and we men have the mockery and semblance of it only for our heaviest punishment.

*Pathologic Accelerations*

All the purposes of good that the beauty of nature can accomplish may be better fulfilled by the meanest of her realities than by the brightest of her imitations. For prolonged entertainment no picture can be compared with the wealth of interest to be found in the herbage of the poorest field. As suggestive of supernatural power, the passing away of a fitful rain-cloud is, in its change and mystery, more pregnant than any picture. Thus a child receives a religious lesson from a real flower more willingly than from a printed one, and can be taught to understand the nineteenth psalm on a starry night better than by diagrams of the constellations.

*Pathologic Repetitions*

The power of the masters is shown by their self-annihilation. It is commensurate with the degree in which they themselves appear not in their work. The harp of the minstrel is untruly touched if the minstrel's glory is all that it records. Every great writer may be at once known by his guiding the mind far from himself, to the beauty which is not of his creation, and to the knowledge which is past his finding out.

*Sound Unit Sequence Inversions*

Our modern systems of government were not introduced overnight. They represent the culmination of hundreds of years of preparation, sacrifice and organization. Yet

hundreds, nay thousands, of people become apprehensive whenever a governmental function is subjected to temporary misuse and cannot be persuaded from the conviction that the entire system of republican government is basically corrupt and doomed to failure.[4]

*Sound Unit Omissions*

Probably no science fascinates the average man more than the science of history. History is peculiarly interesting in that it concerns itself with human experience and charts off the heights, depths and widths of the human soul. History has no boundaries, encompassing all that we know as psychology, economics, sociology, literature, mathematics, politics and philosophy.[5]

*Sound Unit Additions*

Henry made his living playing athletic roles for the United States Film Company—roles that made it compulsory for him to risk that valuable life of his at least a dozen times a day. Once he was called on to stage a fight close to the edge of one of the big concrete columns supporting the Municipal Bridge and to finally fall two hundred feet to the water below, still fighting. It was a wonder he wasn't drowned.

*Sound Unit Substitutions*

Mountains are, to the rest of the body of the earth, what violent muscular action is to the body of man. The muscles and tendons of its anatomy are, in the mountains, brought out with fierce and convulsive energy, full of expression, passion and strength. The plains and the lower hills are the repose and the effortless motion of the frame, when its muscles lie dormant and concealed beneath the lines of its beauty, yet ruling those lines in their every undulation. The spirit of the hills is action; that of the lowlands, repose; and between these there is to be found every variety of motion and of rest

[4] Letters printed in heavy type indicate sound unit sequences in this selection which are especially likely to be inverted.

[5] Letters printed in heavy type indicate sound units in this selection which are especially likely to be omitted.

> —from the inactive plain sleeping like the firmament, with cities for stars, to the fiery peaks which, with the clouds drifting like hair from their bright foreheads, lift up their Titan hands to Heaven, saying, "I live forever!"

While these paragraphs are being read, the instructor should listen critically, concentrating his attention, as before, upon but one factor at a time in the order indicated by the marginal markings. All criticisms that occur to him during the reading he should then embody in a written memorandum such as the following:

*Form 2*

Patient's Name ........................................
Instructor ........................................
Date ........................................

| TYPE OF DEFECT | COMMENT |
|---|---|
| (A) Defective Tone Quality | ........................ |
| (B) General Indistinctness | ........................ |
| (C) Defective Intonation | ........................ |
| (D) Defective Breath Grouping | ........................ |
| (E) Defective Stress Placement | ........................ |
| (F) Pathologic Retardations | ........................ |
| (G) Pathologic Prolongations | ........................ |
| (H) Pathologic Accelerations | ........................ |
| (I) Pathologic Repetitions | ........................ |

| TYPE OF DEFECT | COMMENT |
|---|---|
| (J) Sound Unit Sequence Inversions | ............................ |
| (K) Sound Unit Omissions | ............................ |
| (L) Sound Unit Additions | ............................ |
| (M) Sound Unit Substitutions | ............................ |

(2) *Arranging the Patient's Defects in Convenient Groups.* When the instructor has detected as many of his patient's defects as he possibly can, he should arrange them in convenient groups according to immediately discernible acoustic and physiologic relationships. Thus—

(1) Erroneous substitutions of S for Z, F for V, T for D, CH for J, SH for ZH, K for G, TH *as in* THIN for TH *as in* THEN, P for B and WH for W he may group as indicative of a consistent tendency on the part of the patient to replace properly occurring voiced consonants with their breathed cognates. The term *cognate confusion* may be conveniently employed to designate such a tendency.

(2) Erroneous substitutions of T for TH *as in* THIN, D for TH *as in* THEN and CH for Y, he may group as indicative of a consistent tendency on the part of the patient to substitute plosive consonants for properly occurring fricative consonants wherever the former can be produced in the immediate anatomic vicinity of the latter. The term *modate confusion* may be conveniently employed to designate such a tendency.

(3) Erroneous substitutions of T for K and D for G he may group as indicative of a consistent tendency on the part of the patient to substitute lingua-rugal plosives for properly occurring

lingua-velar plosives. The term *ruvate confusion* may be conveniently employed to designate such a tendency.

(4) Erroneous substitutions of E *as in* WEAL for I *as in* WILL, A *as in* LACE for E *as in* LESS and OO *as in* BOOT for OO *as in* BOOK he may group as indicative of a consistent tendency on the part of the patient to substitute convex for properly occurring concave vowels. The term *tensate confusion* may be conveniently employed to designate such a tendency.

(5) Erroneous omissions of T, D, K, G, P and B in such defective utterances as FIRS' for FIRST, AN' for AND, AS' for ASK, RECO'NIZE for RECOGNIZE, GRAS' for GRASP, PROBALY for PROBABLY, etc., he may group as indicative of a consistent tendency on the part of the patient to omit, wherever lingually expedient, all medial and final plosive consonants. The term *plosive elision* may be conveniently employed to designate such a tendency.

All groupings such as the above which the instructor is able to establish from an analysis of his Form 1 and Form 2 data he should embody in a third memorandum as indicated below. It should be noted that the groupings on this third memorandum need not involve the organization of *all* Form 1, 2 data, since a number of the patient's speech defects may prove to be quite isolated both acoustically and physiologically. In the diagnostic procedure, therefore, Form 3 supplements rather than supplants Forms 1 and 2.

*Form 3*

Patient's Name ..............................................
Instructor ..............................................
Date ..............................................

DEFECT GROUPINGS

(1) ..........................................................
..........................................................
(2) ..........................................................
..........................................................
(3) ..........................................................
..........................................................
(4) ..........................................................
..........................................................

(3) *Classifying the Patient's Defects According to Cause.* Having detected all the defects in his patient's speech and arranged them, as far as possible, in convenient groups, the instructor must next conduct an analysis into their causes. This analysis should begin with a thorough inspection of the patient's speech mechanism for diseases, traumas and congenital malformations. (See pp. 233–286 for exact procedure.) The findings of this inspection the instructor should embody in the following form:

*Form 4*

*For the Diagnosis of Organic Speech Defects*

Patient's Name ..........................................
Instructor ..........................................
Date ..........................................

| LOCATION | DEFECT | COMMENT |
| --- | --- | --- |
| NOSE | Nasal Catarrh | ........................ |
| | Deviate Septum | ........................ |
| | Hanging Turbinates | ........................ |
| | Polypoid Growths | ........................ |
| | Adenoid Vegetation | ........................ |

| LOCATION | DEFECT | COMMENT |
|---|---|---|
| | Edentulations | ........................ |
| | Dental Obtrusions | ........................ |
| | Dental Intrusions | ........................ |
| | Overshot Jaw | ........................ |
| | Undershot Jaw | ........................ |
| | Open-Bite | ........................ |
| | High Palatal Arch | ........................ |
| | Cleft Palate | ........................ |
| MOUTH | Velar Insufficiency | ........................ |
| | Uvular Elongation | ........................ |
| | Tongue-tie | ........................ |
| | Hare-lip | ........................ |
| | Labial Paralysis | ........................ |
| | Lingual Paralysis | ........................ |
| | Labial Traumas | ........................ |
| | Lingual Traumas | ........................ |
| | Tonsilitis | ........................ |
| THROAT | Pharyngitis | ........................ |
| | Quinsy | ........................ |
| | Laryngitis | ........................ |
| LARYNX | Laryngeal Paralysis | ........................ |
| | Laryngeal Growths | ........................ |

*Patient's Speech Defects Causally Related to Diseases, Traumas and Congenital Malformations Above Noted* ...............

..................................................

..................................................

..................................................

..................................................

When the instructor has completed his examination of the patient's speech mechanism and recorded all significant observations as above indicated, he should at once set about establishing causal relationships between these

observations and the speech defects (and defect groupings) noted Forms 1, 2, 3. Thus if the instructor discovers from his examination that the patient lacks both upper central incisors he should infer that there is a causal relationship between this condition and the defective production of such sound units as TH *as in* THEN, TH *as in* THIN, F *as in* FINE, V *as in* VINE, S *as in* SINK and Z *as in* ZINC. Similarly, if the instructor discovers from his examination that the patient has chronic laryngitis, pharyngitis and nasal catarrh, he should causally relate these conditions to any previously noted speech defects which involve a harsh, graty, muffled or nasal production of tone. In like manner, if the instructor discovers from his examination that the patient is suffering from a severe case of tongue-tie, he should causally relate this condition in his memoranda to any previously noted defects which involve the imperfect utterance of lingua-rugal and lingua-palatal consonants. A detailed exposition of the cause-and-effect data which the instructor must consider to infer these relationships with scientific accuracy, we shall reserve for a subsequent section. (See "Organic Defects," pp. 233–277.)

Provided all of the patient's speech defects have not been explained on the basis of structural inadequacies of the speech mechanism, the instructor should proceed with his diagnostic investigation by inquiring orally into the patient's history for determinants of foreign dialect. If the patient spoke a foreign language in childhood, what was it? how long was it spoken? under what conditions was it learned? If the patient spoke any other foreign languages before he took up English, what were they? how long were they spoken? how well and under what

conditions were they learned? What are the present language conditions in the patient's home environment? The answers to these inquiries should be systematically recorded as indicated below and causal relationships then established between the new diagnostic data and the patient's speech defects.

Thus, if the instructor finds that his patient—a boy of eighteen, let us say—

> (1) spoke German during the first 16 years of his life
>
> (2) immigrated to the United States when he was 17 and then "picked up" English as best he could, unaided by phonetic instruction
>
> (3) still speaks German with his parents at home and with numerous German-American acquaintances

he should relate these findings causally to previously noted defects in the patient's speech which involve the substitution of D for TH *as in* THEN, T for TH *as in* THIN, V for W, E *as in* LESS for A *as* in FLAT, SH for CH, J for ZH, O *as in* NOTE for A *as in* FLAW and F for WH. A complete exposition of the cause-and-effect data to be considered in inferring such a causal relationship we must reserve, as before, for a subsequent section. (See "Defects of Foreign Dialect," pp. 160–207.)

*Form 5*
*For Diagnosis of Foreign Dialect*

Patient's Name .......................... Age ........
Instructor ..........................
Date ..........................
1. Language First Spoken ..............................
2. Other Languages Spoken in Order of Introduction (Age and Circumstances of Introduction)
    a. ..........................................

b. ..............................................

c. ..............................................

3. Present Language Conditions in Patient's Home Environment ..............................................

..............................................

..............................................

..............................................

*Patient's Speech Defects Attributable to Foreign Dialect as Diagnosed from Above Data* ..............................

..............................................

..............................................

The instructor should next inquire into his patient's history for determinants of speech provincialism. Did the patient live for any considerable length of time in a community which, tho part of the United States, was cut off by geographic, racial, economic or socio-religious barriers from the main stream of national life? In what ways did the speech of this community differ markedly from the standard speech of the nation? What educational influences, if any, tended to counteract speech provincialism in the patient? The diagnostic data obtained from these inquiries should be carefully recorded by the instructor in the manner indicated below. Causal relationships between the data in question and the patient's speech defects should be then determined by accurate analysis. (See "Provincial Dialect," pp. 208–219 for complete exposition of cause-and-effect data to be considered in determining these relationships.)

*Form 6*

*For Diagnosis of Provincial Dialect*

Patient's Name ............................ Age ........

Instructor ............................

Date ............................

1. Communities in the United States in Which Patient has Resided: (a) ....................................
   Length of Residence ....................
   (b) ....................................
   Length of Residence ....................
   (c) ....................................
   Length of Residence ....................
   (d) ....................................
   Length of Residence ....................
2. Geographic Backgrounds of Communities in Which Patient has Resided: (a) ..............................
   (b) ..............................
   (c) ..............................
   (d) ..............................
3. Racial Backgrounds of Communities in Which Patient has Resided: (a) ....................................
   (b) ....................................
   (c) ....................................
   (d) ....................................
4. Economic Backgrounds of Communities in Which Patient has Resided: (a) ..............................
   (b) ..............................
   (c) ..............................
   (d) ..............................
5. Socio-religious Backgrounds of Communities in Which Patient has Resided: (a) ..........................
   (b) ..........................
   (c) ..........................
   (d) ..........................
6. Counter-influences to Provincialism in Patient's Life:
   (a) *School Training* ..........................
   (b) *Special Speech Training* ....................
   ..............................................
   (c) *Travel* ......................................
   (d) *Miscellaneous Cultural Contacts* ..............
   ..............................................
   ..............................................
   ..............................................

*Patient's Speech Defects Attributable to Provincial Dialect as Diagnosed from Above Data:* ...........................

.........................................................

.........................................................

The instructor should next inquire into his patient's history for determinants of speech carelessness. How has the patient been trained to look upon careful speech—as an economic and social asset or as a "high brow" affectation? What has been the general disciplinary development of the patient? What are his moral and esthetic ideals? A diagnosis of carelessness on the basis of data gained from these inquiries should serve to explain many of the patient's speech defects unattributable to structural inadequacy of the speech mechanism, foreign dialect or provincial dialect. (See "Defects of Carelessness," pp. 224–232 for complete exposition of causal relationships between carelessness and defective speech.)

*Form 7*

*For the Diagnosis of Speech Carelessness*

Patient's Name ............................ Age ........
Instructor ............................
Date ............................

1. Attitude of Patient's Parents toward Careful Speech .....
.........................................................
2. Attitude of Patient's Business and Social Acquaintances toward Careful Speech ..............................
3. Attitude of Patient toward Careful Speech ...............
.........................................................
4. General Disciplinary Development of Patient .............
.........................................................
5. Moral and Esthetic Ideals of Patient ...................
.........................................................
.........................................................

*Patient's Speech Defects Attributable to Carelessness as Diagnosed from Above Data* ............................
..............................................................
..............................................................
..............................................................

The instructor should proceed with his diagnostic investigation by inquiring into his patient's history for determinants of speech infantilism. When and how did the patient make the transition from infantile to adult standards of speech? Was the patient compelled to make this transition at an early age under the spur of parental correction and the ridicule of older playfellows? Or did parents and admiring relatives give the patient to understand that "baby talk" was extremely "cute" and hence a mode of expression to be persisted in as long as possible? Was the patient secluded in the home and there guarded from the harsh realities of life overlong? Upon the basis of data obtained from these inquiries the instructor should be able to tell whether or not certain of his patient's speech defects are symptoms of infantile perseveration. (For a complete exposition of the causal relationships between infantile perseveration and speech defects, see "Defects of Infantile Perseveration," pp. 220–223.)

*Form 8*

*For the Diagnosis of Speech Infantilism*

Patient's Name .......................... Age ........
Instructor ..........................
Date ..........................

1. Were Parents Lax in Insisting on Patient's Early Transition from Infantile to Adult Standards of Speech? .........
..............................................................
..............................................................

2. Was Patient Secluded from Customary Social Contacts That Would Demand an Early Transition from Infantile to Adult Standards of Speech? ..........................
.....................................................
.....................................................

*Patient's Speech Defects Attributable to Speech Infantilism as Diagnosed from Above Data* ..............................
.....................................................
.....................................................
.....................................................
.....................................................

As the final and perhaps the most difficult step of the diagnosis the instructor should examine his patient carefully for signs of a functional nervous disturbance. Are there any hereditary tendencies to nervousness in the patient's family? Was the patient a precocious child? Has the patient any unusual character traits—hobbies—eccentricities—mannerisms? Has the patient any serious organ inferiorities? Has he been subjected to any important psycho-sexual traumata?[6] Does he exhibit any abnormal psycho-sexual trends? Does he seem to be in a constant state of anxious tension? Does he suffer from phobias, obsessions, compulsions, general irritability, absent-mindedness, insomnia, melancholia or strange shifting pains? The information elicited by these inquiries should enable the instructor to determine whether or not certain of his patient's speech defects are symptoms of a psychoneurosis. (See "Neurotic Speech Defects," pp. 278–286 for a detailed exposition of the causal relationships between functional nervousness and speech defects.)

[6] Correct answers to these questions cannot, of course, be obtained off-hand. (See discussion of the psychanalytic method pp. 281–282.)

*Form 9*
*For Diagnosis of Neurotic Speech Defects*

Patient's Name ............................ Age ........
Instructor ............................
Date ............................
1. Hereditary Tendencies to Nervousness ..................
..................................................
2. Precocity ..............................................
..................................................
3. Neurotic Character Traits
   (a) Non-social ..................................
   (b) Secretive ..................................
   (c) Timid ......................................
   (d) Over-sensitive ..............................
   (e) Melancholy ..................................
   (f) Suspicious ..................................
   (g) Indecisive ..................................
   (h) Self-doubting ................................
   (i) Bashful ....................................
   (j) Emotional ..................................
4. Eccentricities, Mannerisms and Hobbies .................
..................................................
..................................................
5. Organ Inferiorities ....................................
..................................................
6. Psychosexual Traumata ................................
..................................................
..................................................
..................................................
7. Abnormal Psychosexual Trends .........................
..................................................
..................................................
8. Psychological Indices of Functional Nervousness
   (a) Chronic Over-anxiety ........................
   (b) Acute Anxiety Attacks ........................
   (c) Phobias ....................................
   (d) Obsessions ..................................

(e) Compulsions ..............................
(f) Absent-mindedness ..........................
(g) Hypochondria ..............................
(h) Nightmare ................................

9. Physiological Indices of Functional Nervousness
(a) Respiratory Disturbances for Which There Can Be Demonstrated no Organic Basis ..........
..........................................
(b) Cardiac Disturbances for Which There Can Be Demonstrated no Organic Basis .............
..........................................
(c) Digestive Disturbances for Which There Can Be Demonstrated no Organic Basis .............
..........................................
(d) Vaso-motor Disturbances for Which There Can Be Demonstrated no Organic Basis ..........
..........................................
(e) Insomnia .................................
(f) Enuresis .................................
(g) Attacks of Trembling and Shaking ...........
(h) Attacks of Bulimia ........................
(i) Attacks of Locomotor Giddiness ..............
(j) Attacks of Paresthesia .......................
(k) Muscular Cramps, Tics and Pains ............
(l) Sudden Urge for Micturition ................
(m) Sudden Deep Sighs ........................
(n) Sudden On-coming of Feeling of Weariness ....
..........................................

*Patient's Speech Defects Attributable to Functional Nervousness as Diagnosed from Above Data* ....................
..............................................
..............................................
..............................................

Before terminating the diagnosis the instructor should transfer the findings of his separate diagnostic inquiries to a single key chart.

*Form 10*

Patient's Name ............................ Age ........
Instructor ............................
Date ............................

1. Defects detected in patient's speech by auditory analysis (Forms 1, 2)
   - (a) Defective Tone Quality ......................
   - (b) General Indistinctness ......................
   - (c) Defective Intonation ........................
   - (d) Defective Breath Grouping ..................
   - (e) Defective Stress Placement .................
   - (f) Pathologic Retardations .....................
   - (g) Pathologic Prolongations ...................
   - (h) Pathologic Accelerations ...................
   - (i) Pathologic Repetitions ......................
   - (j) Sound Unit Sequence Inversions .............
     ........................................
   - (k) Sound Unit Omissions [7] ....................
     ........................................
   - (l) Sound Unit Additions ......................
     ........................................
     ........................................
   - (m) Sound Unit Substitutions [7] .................
     ........................................
     ........................................
     ........................................

2. Patient's Speech Defects Arranged in Convenient Groups According to Immediately Discernible Acoustic and Physiologic Relationships (Form 3) .................

..................................................
..................................................
..................................................
..................................................

[7] Since all defects noted on Form 1 assume the form of either SOUND UNIT OMISSIONS or SOUND UNIT SUBSTITUTIONS, they should be entered after headings K and M together with any additional defects noted on Form 2, Sections K and M. (See footnote p. 144.)

3. Patient's Speech Defects Classified According to Cause (Forms 4, 5, 6, 7, 8, 9)

| | ORGANIC DEFECTS | FOREIGN DIALECT | PROVINCIAL DIALECT | CARELESSNESS | SPEECH INFANTILISM | PSYCHONEUROSIS |
|---|---|---|---|---|---|---|
| Defective Tone Quality | | | | | | |
| General Indistinctness | | | | | | |
| Defective Intonation | | | | | | |
| Defective Breath Grouping | | | | | | |
| Defective Stress Placement | | | | | | |
| Pathologic Retardations | | | | | | |
| Pathologic Prolongations | | | | | | |
| Pathologic Accelerations | | | | | | |
| Pathologic Repetitions | | | | | | |
| Sound Unit Sequence Inversions | | | | | | |
| Sound Unit Omissions | | | | | | |
| Sound Unit Additions | | | | | | |
| Sound Unit Substitutions | | | | | | |

It should be noted that one cause of a given speech defect need not exclude a second. Thus the erroneous substitution of T *as in* TOWN for K *as in* KATE may result from the conjunction of two causal influences—*bifid uvula* and *infantile perseveration.* Similarly, the erroneous substitution of D *as in* DOWN for TH *as in* THEN may result from the conjunction of three causal influences—*upper front edentulation, foreign dialect* and *provincial dialect.*

**Treatment.** According to the nature of diagnostic findings, the treatment of a case of defective speech may involve one, several or all of the following measures:

(*1*) *Development of a desire for good speech*
(*2*) *General phonetic instruction*
(*3*) *Special phonetic drills*
(*4*) *Maxillary, labial, lingual and velar gymnastics*
(*5*) *Mechanical interventions and stimulations*
(*6*) *Trial-and-error drill in direct imitation*
(*7*) *Voice reproduction*
(*8*) *Habit formation drills*
(9) *Medication*
(*10*) *Surgery*
(*11*) *Prosthetic dentistry*
(*12*) *Auto, hetero and hypnotic suggestion*
(*13*) *Psychanalysis*

Which of these measures should the instructor "prescribe" for one set of defects and which for another? Only thru a detailed study of the special problems involved in the treatment of each of the six causal classifications of speech defects shall we be able to answer this question.

# CHAPTER V

## *DEFECTS OF FOREIGN DIALECT*

The characteristic defects of foreign dialect include:

(1) sound unit substitutions
(2) sound unit additions
(3) sound unit omissions
(4) misplaced stress
(5) incorrect intonation

**Sound Unit Substitutions.** There are four important reasons why foreigners, when they are first learning to speak our language, almost invariably replace certain properly occurring sound units of standard English with other sound units slightly or totally different:

(1) They encounter in spoken English a number of totally unfamiliar sounds—sounds which do not occur in their mother languages at all.

(2) They encounter in spoken English a number of sounds, which, while familiar to them as phonetic units of their mother tongues, occupy in English new and unfamiliar positions—i. e., they encounter sounds in final positions in English which occur only initially in their mother languages, and *vice versa.*

(3) They encounter in spoken English a number of words which differ so slightly in acoustic content from words of like meaning contained in their native languages, that their untrained ears often fail to note any distinction whatever.

(4) They encounter in written English a new and utterly bewildering system of spelling.

### (1) UNFAMILIAR SOUNDS

To analyze adequately the sound unit substitutions of foreign dialect due to the first of these reasons, we must consider in detail each of the major modern European languages.

GERMAN [1]—In the German language the following sound units of standard English speech are totally lacking:

WH *as in* WHAT
W *as in* WATT
TH *as in* THIN
TH *as in* THEN
ZH *as in* AZURE
J *as in* JOKE
A *as in* FLAT
U *as in* STUB
A *as in* FLAW

When a German immigrant tries to speak English without adequate phonetic instruction—i. e., when he tries to "pick up" the language—he has a tendency to replace the sound units above listed with other and, for him, easier sounds, preferably sounds which occur in his native tongue and which in his estimation are acoustically similar to those he is trying to imitate. Thus, for the English sound TH *as in* THEN, a sound which does not occur in German, he substitutes the acoustically similar

[1] The state language of Switzerland is approximately the same as that of Germany; the above data may therefore be considered applicable to Swiss.

sound D *as in* DOWN, a sound which does occur in German. According to the same principle he also substitutes—

| | | |
|---|---|---|
| F *as in* FINE | for | WH *as in* WHAT |
| V *as in* VINE | for | W *as in* WATT |
| T *as in* TOWN | for | TH *as in* THIN |
| D *as in* DOWN | for | TH *as in* THEN |
| SH *as in* ASSURE | for | ZH *as in* AZURE |
| Y *as in* YOUR or CH *as in* CHOKE | for | J *as in* JOKE |
| O *as in* NOTE or A *as in* FLAW | for | U *as in* STUB |
| E *as in* LESS | for | A *as in* FLAT |
| O *as in* NOTE | for | A *as in* FLAW |

These substitutions may be noted in such typical utterances of German dialect as the following:

| | |
|---|---|
| GERMAN DIALECT | Vell den, vat do you tink of diss het? |
| STANDARD ENGLISH | *Well then, what do you think of this hat?* |
| GERMAN DIALECT | Vy shouldt ve ged deess poyss in trawble? |
| STANDARD ENGLISH | *Why should we get these boys in trouble?* |
| GERMAN DIALECT | I haf no pleashure on diss chop. |
| STANDARD ENGLISH | *I have no pleasure on this job.* |

FRENCH—The French language lacks the following sound units contained in standard English:

| | | |
|---|---|---|
| WH | *as in* | WHAT |
| TH | *as in* | THIN |
| TH | *as in* | THEN |
| CH | *as in* | CHOKE |
| R | *as in* | ROAR |
| A | *as in* | LACE |
| OO | *as in* | BOOK |

The French immigrant who tries to speak our language without adequate phonetic instruction finds it practically impossible to produce these sounds and consequently replaces them with acoustically similar sounds of his native tongue. He thus substitutes—

| | | |
|---|---|---|
| V *as in* VINE | for | WH *as in* WHAT |
| Z *as in* ZINC | for | TH *as in* THEN |
| SH *as in* ASSURE | for | CH *as in* CHOKE |
| OO *as in* BOOT | for | OO *as in* BOOK |
| S *as in* SINK or Z *as in* ZINC | for | TH *as in* THIN |

He also substitutes, for the English consonant R *as in* ROAR, a peculiar guttural sound made by trilling the tip of the uvula against the pharyngeal wall and, for the English vowel A *as in* LACE, the French vowel E *as in* *IMPOSSIBLE.*

The substitutions above listed may be noted in the following typical utterances of French dialect:

| | |
|---|---|
| FRENCH DIALECT | Zen you sink zis shanss is worse-vile? |
| STANDARD ENGLISH | *Then you think this chance is worth while?* |
| FRENCH DIALECT | Shentlemen! Zere ar-r-r [2] ladies pr-resent. |
| STANDARD ENGLISH | *Gentlemen! There are ladies present.* |
| FRENCH DIALECT | Sank you, but zee mait tuk my sings. |
| STANDARD ENGLISH | *Thank you, but the maid took my things.* |

YIDDISH—Yiddish lacks the following sounds contained in standard English.

| | | |
|---|---|---|
| WH | *as in* | WHAT |
| W | *as in* | WATT |
| TH | *as in* | THIN |
| TH | *as in* | THEN |
| R | *as in* | ROAR |
| NG [3] | *as in* | SUNG |
| A | *as in* | LACE |
| A | *as in* | FLAT |
| U | *as in* | STUB |
| O | *as in* | NOTE |
| A | *as in* | AMID |

[2] "R-R-R" will be used in these illustrations of foreign dialects, for want of a better method of notation, to represent the *guttural* R.

[3] The statement that NG is not contained in Yiddish must be qualified. This sound does occur in Yiddish—but not as an independent phonetic unit. Wherever NG occurs in Yiddish it is encountered as the first element of the consonant compound NG + K or NG + G. The same is true of Russian, Roumanian, Hungarian, Czecho-Slovakian and Jugo-Slav.

When the Hebrew immigrant attempts to speak our language without adequate instruction, he commonly substitutes, upon encountering the above sounds,—

| | | | | | |
|---|---|---|---|---|---|
| V | *as in* VINE | for | WH *as in* WHAT<br>and<br>W *as in* WATT | | |
| T | *as in* TOWN | for | TH | *as in* | THIN |
| D | *as in* DOWN | for | TH | *as in* | THEN |
| E | *as in* LESS | for | A *as in* LACE<br>and<br>A *as in* FLAT<br>and<br>A *as in* AMID | | |
| O | *as in* STOP | for | U | *as in* | STUB |
| OO | *as in* BOOT | for | O | *as in* | NOTE |

He also substitutes, for the English consonant R *as in* ROAR, a uvular trill, and, for the English nasal resonant NG *as in* SUNG, the *nasal resonant—plosive consonant* compound NG + K or NG + G.

These substitutions may be noted in the following typical utterances of Yiddish dialect:

| | |
|---|---|
| YIDDISH DIALECT | Sell kesh kluss? Buy kesh kluss! |
| STANDARD ENGLISH | *Sell cash clothes? Buy cash clothes!* |
| YIDDISH DIALECT | Vat iss diss men'ss vaise meas-hur-r-r, Mawr-riss? |
| STANDARD ENGLISH | *What is this man's waist measure, Morris?* |

| | |
|---|---|
| YIDDISH DIALECT | Ve pey less r-rent for-r fletss in Longk Islend! |
| STANDARD ENGLISH | *We pay less rent for flats in Long Island!* |

SPANISH—Spanish lacks the following sound units contained in standard English:

WH *as in* WHAT
Z *as in* ZINC
SH *as in* ASSURE
J *as in* JOKE
NG *as in* SUNG
I *as in* WILL
OO *as in* BOOK
A *as in* FLAW
I *as in* BIRD
A *as in* AMID

The Spanish immigrant finds it extremely difficult to master these sounds of English speech when he attempts to learn our language without adequate instruction. Because of this difficulty he commonly substitutes—

| | | | | |
|---|---|---|---|---|
| W | *as in* WATT | for | WH | *as in* WHAT |
| TH | *as in* THEN | for | Z | *as in* ZINC |
| S | *as in* SINK | for | SH | *as in* ASSURE |
| Z | *as in* ZINC | for | ZH | *as in* AZURE |
| H | *as in* HAND | for | J | *as in* JOKE |
| N | *as in* STUN | for | NG | *as in* SING |
| E | *as in* WEAL | for | I | *as in* WILL |
| OO | *as in* BOOT | for | OO | *as in* BOOK |
| A | *as in* STAR | for | A | *as in* FLAW |

| | | | |
|---|---|---|---|
| A *as in* BARE | for | I | *as in* BIRD |
| A *as in* LACE or O *as in* STOP | for | A | *as in* AMID |

The substitutions noted above may be found in such typical utterances of Spanish dialect as the following:

| | |
|---|---|
| SPANISH DIALECT | I theenk I should veeseet thees seety fairst. |
| STANDARD ENGLISH | *I think I should visit this city first.* |
| SPANISH DIALECT | I have hust feeneesed readin thees lah buk. |
| STANDARD ENGLISH | *I have just finished reading this law book.* |
| SPANISH DIALECT | Een Brazeel we leeve een eathe and luksorry. |
| STANDARD ENGLISH | *In Brazil we live in ease and luxury.* |

NORWEGIAN—The Norwegian language lacks the following sound units contained in standard English:

WH *as in* WHAT
W *as in* WATT
TH *as in* THIN
TH *as in* THEN
Z *as in* ZINC
ZH *as in* AZURE
CH *as in* CHOKE
J *as in* JOKE
R *as in* ROAR
Y *as in* YOUR
A *as in* LACE

U *as in* STUB
O *as in* NOTE
OO *as in* BOOK

The Norwegian immigrant commonly substitutes for these sounds, when he attempts to learn English unaided by phonetic instruction, acoustically similar sounds of his native tongue. E. g.—

| | | |
|---|---|---|
| V *as in* VINE | for | WH *as in* WHAT<br>and<br>W *as in* WATT |
| T *as in* TOWN | for | TH *as in* THIN |
| D *as in* DOWN | for | TH *as in* THEN |
| S *as in* SINK | for | Z *as in* ZINC |
| SH *as in* ASSURE | for | ZH *as in* AZURE<br>and<br>CH *as in* CHOKE |
| Y *as in* YOUR | for | J *as in* JOKE |
| O *as in* STOP<br>or<br>E *as in* LESS | for | A *as in* LACE |
| E *as in* LESS<br>or<br>A *as in* FLAW | for | U *as in* STUB |
| A *as in* FLAW | for | O *as in* NOTE |
| OU *as in* LOUD<br>or<br>O *as in* NOTE<br>or<br>OO *as in* BOOT | for | OO *as in* BOOK |

He also substitutes a uvular trill for the English consonant R *as in* ROAR.

The substitutions listed above are illustrated in the following typical utterances of Norwegian dialect:

| | |
|---|---|
| NORWEGIAN DIALECT | Yumpin Yiminny! Vat a long your-rney! |
| STANDARD ENGLISH | *Jumping Jiminny! What a long journey!* |
| NORWEGIAN DIALECT | Ay hawp Yohn br-ring sheess hawm fr-rawm town. |
| STANDARD ENGLISH | *I hope John brings cheese home from town.* |
| NORWEGIAN DIALECT | Shaynsh her-r for all nor-rt, sout and vest car-r-ss! |
| STANDARD ENGLISH | *Change here for all north, south and west cars!* |

DANISH—Danish lacks the following sounds contained in standard English:

WH *as in* WHAT
W *as in* WATT
TH *as in* THIN
TH *as in* THEN
ZH *as in* AZURE
CH *as in* CHOKE
R *as in* ROAR
OO *as in* BOOK

The Danish immigrant finds it difficult to master these sounds when he attempts to learn English without ade-

quate phonetic instruction and hence has a tendency to replace them with acoustically similar sounds of his native language. Thus he substitutes—

| | | |
|---|---|---|
| V *as in* VINE | for | WH *as in* WHAT and W *as in* WATT |
| S *as in* SINK | for | TH *as in* THIN |
| D *as in* DOWN | for | TH *as in* THEN |
| SH *as in* ASSURE | for | CH *as in* CHOKE and ZH *as in* AZURE |
| OO *as in* BOOT | for | OO *as in* BOOK |

He also substitutes a uvular trill for the English consonant R *as in* ROAR.

These substitutions are illustrated in the following typical utterances of Danish dialect:

DANISH DIALECT Diss iss a vonder-rfool occashun.
STANDARD ENGLISH *This is a wonderful occasion.*
DANISH DIALECT Der-r iss no shanss uff dat.
STANDARD ENGLISH *There is no chance of that.*
DANISH DIALECT Sink uff vat diss cost!
STANDARD ENGLISH *Think of what this cost!*

SWEDISH—Swedish lacks the following sound units contained in standard English:

WH *as in* WHAT
W *as in* WATT
TH *as in* THIN
TH *as in* THEN
R *as in* ROAR

The Swedish immigrant finds it difficult to master these sounds of English speech when he attempts to learn the language unaided by phonetic instruction. On account of this difficulty he commonly substitutes:

| | | | |
|---|---|---|---|
| V *as in* VINE | for | W *as in* WATT and WH *as in* WHAT | |
| T *as in* TOWN | for | TH *as in* THIN | |
| D *as in* DOWN | for | TH *as in* THEN | |

He also substitutes a uvular trill for the English consonant R *as in* ROAR.

These substitutions are illustrated in the following typical utterances of Swedish dialect:

| | |
|---|---|
| SWEDISH DIALECT | Ay vorked tree monts in da big nort voots. |
| STANDARD ENGLISH | *I worked three months in the big north woods.* |
| SWEDISH DIALECT | Dees faller-rss can't play yoke on me. |
| STANDARD ENGLISH | *These fellows can't play a joke on me.* |
| SWEDISH DIALECT | Ay cer-rtainly vill vote for-r Yohnson. |
| STANDARD ENGLISH | *I certainly will vote for Johnson.* |

ROUMANIAN—Roumanian lacks the following sound units contained in standard English:

WH *as in* WHAT
TH *as in* THIN
TH *as in* THEN

| | | |
|---|---|---|
| J | *as in* | JOKE |
| NG[4] | *as in* | SUNG |
| A | *as in* | FLAT |
| I | *as in* | BIRD |

The Roumanian immigrant who attempts to speak our language without adequate phonetic instruction, when confronted by these sounds, commonly substitutes—

| | | | | | | |
|---|---|---|---|---|---|---|
| V | *as in* | VINE | for | WH | *as in* | WHAT |
| T | *as in* | TOWN | for | TH | *as in* | THIN |
| Z | *as in* | ZINC | for | TH | *as in* | THEN |
| ZH | *as in* | AZURE | for | J | *as in* | JOKE |
| E | *as in* | LESS or | for | A | *as in* | FLAT |
| O | *as in* | STOP | | | | |
| I | *as in* | WILL | for | I | *as in* | BIRD |

He also substitutes the *nasal resonant-plosive consonant* compound NG + K or NG + G for the English nasal resonant NG *as in* SING.

These substitutions are illustrated in the following typical utterances of Roumanian dialect:

| | |
|---|---|
| ROUMANIAN DIALECT | Zere iss no lent like ziss America. |
| STANDARD ENGLISH | *There is no land like this America.* |
| ROUMANIAN DIALECT | Vat an azhe ve are livingk in! |
| STANDARD ENGLISH | *What an age we are living in!* |

[4] See footnote page 164.

| | |
|---|---|
| ROUMANIAN DIALECT | I tink zet zee vezzer iss nice. |
| STANDARD ENGLISH | *I think that the weather is nice.* |

HUNGARIAN—Hungarian lacks the following sounds contained in standard English:

| | |
|---|---|
| WH | *as in* WHAT |
| W | *as in* WATT |
| V | *as in* VINE |
| TH | *as in* THIN |
| TH | *as in* THEN |
| R | *as in* ROAR |
| NG[5] | *as in* SUNG |
| I | *as in* WILL |
| A | *as in* BARE |
| A | *as in* AMID |

The Hungarian immigrant finds it extremely difficult to master these sounds and consequently has a tendency to replace them with acoustically similar sounds contained in his native tongue. He therefore commonly substitutes—

| | | |
|---|---|---|
| V *as in* VINE | for | WH *as in* WHAT and W *as in* WATT |
| W *as in* WATT | for | V *as in* VINE |
| T *as in* TOWN or S *as in* SINK | for | TH *as in* THIN |

[5] See footnote p. 164.

| | | | |
|---|---|---|---|
| D *as in* DOWN | for | TH *as in* THEN |
| E *as in* WEAL | for | I *as in* WILL |
| E *as in* LESS | for | A *as in* BARE |
| A *as in* LACE | for | A *as in* AMID |

He also substitutes a uvular trill for the English consonant R *as in* ROAR and the *nasal resonant—plosive consonant* compound NG + K or NG + G for the English nasal resonant NG *as in* SUNG.

These substitutions are illustrated by the following typical utterances of Hungarian dialect:

| | |
|---|---|
| HUNGARIAN DIALECT | Der-r iss nossingk r-r-rong aybout eet. |
| STANDARD ENGLISH | *There is nothing wrong about it.* |
| HUNGARIAN DIALECT | Ve nevair-r haf fer-r vedder-r her-r. |
| STANDARD ENGLISH | *We never have fair weather here.* |
| HUNGARIAN DIALECT | Ve vill fight for-r union vachess—aynd veen! |
| STANDARD ENGLISH | *We will fight for union wages —and win!* |

CZECHO-SLOVAKIAN—The Czecho-Slovakian language lacks the following sounds contained in standard English:

WH *as in* WHAT
W *as in* WATT
TH *as in* THIN
TH *as in* THEN

R *as in* ROAR
NG[6] *as in* SUNG
A *as in* AMID

The Czecho-Slovakian immigrant who attempts to speak our language without the aid of phonetic instruction, when confronted by these sounds, commonly substitutes—

| | | |
|---|---|---|
| V *as in* VINE | for | WH *as in* WHAT and W *as in* WATT |
| T *as in* TOWN or S *as in* SINK | for | TH *as in* THIN |
| D *as in* DOWN or Z *as in* ZINC or TS *as in* CATS | for | TH *as in* THEN |
| A *as in* FLAT | for | A *as in* AMID |

He also substitutes a uvular trill for the English consonant R *as in* ROAR and the *nasal resonant—plosive consonant* compound NG + K or NG + G for the English nasal resonant NG *as in* SUNG.

These substitutions are illustrated by the following typical utterances of Czecho-Slovakian dialect:

CZECH DIALECT Zat's de vor-rst uff it!
STANDARD ENGLISH *That's the worst of it!*

[6] See footnote p. 164.

| | |
|---|---|
| CZECH DIALECT | Nossingk zay cän do vill help. |
| STANDARD ENGLISH | *Nothing they can do will help.* |
| CZECH DIALECT | I haf tr-ree mouts to feet—tsats vy! |
| STANDARD ENGLISH | *I have three mouths to feed—that's why!* |

JUGO-SLAV—Jugo-Slav lacks the following sounds contained in standard English:

WH *as in* WHAT
W *as in* WATT
TH *as in* THIN
TH *as in* THEN
NG[7] *as in* SUNG
I *as in* WILL
A *as in* BARE
A *as in* FLAT
U *as in* STUB
A *as in* FLAW
I *as in* BIRD

A Jugo-Slav immigrant who attempts to learn our language unaided by phonetic instruction, commonly replaces these sounds with acoustically similar sounds of his native language. E. g.—

| | | |
|---|---|---|
| V *as in* VINE | for | WH *as in* WHAT and W *as in* WATT |
| T *as in* TOWN | for | TH *as in* THIN |
| D *as in* DOWN | for | TH *as in* THEN |

[7] See footnote p. 164.

| | | | |
|---|---|---|---|
| E *as in* WEAL | for | I | *as in* WILL |
| E *as in* LESS | for | A | *as in* BARE |
| O *as in* STOP | for | A | *as in* FLAT |
| O *as in* STOP or O *as in* NOTE | for | U | *as in* STUB |
| O *as in* NOTE | for | A | *as in* FLAW |
| E *as in* LESS | for | I | *as in* BIRD |

He also substitutes the *nasal resonant—plosive consonant* compound NG + K or NG + G for the English nasal resonant NG *as in* SUNG.

These substitutions are illustrated in the following typical utterances of Jugo-Slav dialect:

| | |
|---|---|
| JUGO-SLAV DIALECT | Ve hoff just feeneesht eet. |
| STANDARD ENGLISH | *We have just finished it.* |
| JUGO-SLAV DIALECT | He voot r-rodder seengk don eat. |
| STANDARD ENGLISH | *He would rather sing than eat.* |
| JUGO-SLAV DIALECT | Dey say dot mohney iss sker-rss. |
| STANDARD ENGLISH | *They say that money is scarce.* |

*Treatment.* When an immigrant to our country replaces an unfamiliar sound unit of English with a familiar sound unit of his native tongue, the problem of speech correction thus presented is by no means a simple one. To achieve a "cure" the instructor must first—

(1) *make the patient acutely conscious of the acoustic difference between the standard sound that*

*he should produce and the defective sound that he does produce.*[8]

This can be done in either of two ways. The instructor may ask his patient to listen critically while he rapidly produces first the standard, then the substituted sound—continuing this exercise until the patient is able to detect a clean-cut acoustic distinction between the two. Or, still better, the instructor may record both his own and his patient's rendition of a selected utterance on a record to be played by a good voice reproducer.[9] If this record is then played fifteen or twenty times the patient can be taught with perfect clarity and objective accuracy the acoustic differences between the defective sounds in his own speech and the standard sounds in the instructor's speech. The instructor should next—

(2) *develop in the patient a clear visual image of the adjustment that his speech mechanism must make for the production of the new sound.*

To achieve this end the instructor should first adjust his own speech mechanism for the production of the sound in question, requiring that the patient observe closely—i. e., that he note how far the instructor's lower jaw drops, what position the instructor's lips assume, what adjustment the instructor's tongue makes, etc.

[8] The importance of this step cannot be overestimated. The average speech defective never becomes conscious of his defects until he is *made* to hear them.

[9] At the New York University Speech Clinic a voice reproducer marketed as the "Homophone" has been used in this connection with astonishing success. The Homophone is a relatively inexpensive device both in initial cost and maintenance. It may be attached without difficulty to any standard phonograph.

The patient should then be supplied with a hand mirror and required to imitate as closely as possible the articulatory adjustment that he has just observed. In this step the patient's attention should be directed to all visually perceptible differences between the articulatory adjustment that he is imitating for the production of the standard sound and the articulatory adjustment that he has hitherto been making for the production of the defective sound.

The instructor should then sketch for the further visual comprehension of the patient a cross section diagram of the human speech mechanism adjusted for the production of the standard sound—lightly superimposing a sketch of the human speech mechanism adjusted for the production of the defective sound. For example, he should illustrate the visual difference between a properly occurring A *as in* FLAT and an erroneously substituted E *as in* LESS as indicated in Fig. 1 of the accompanying diagram; between a properly occurring TH *as in* THIN and an erroneously substituted T *as in* TOWN as indicated in


Fig. 21

Fig. 2 of the accompanying diagram; and between a properly occurring English R and an erroneously substituted uvular trill (R *as in the German* RACHE) as indicated in Fig. 3 of the accompanying diagram.

In the interests of accuracy the instructor should always supplement free-hand sketches of the above character with something more scientific—preferably with a large, carefully constructed, adjustable chart.

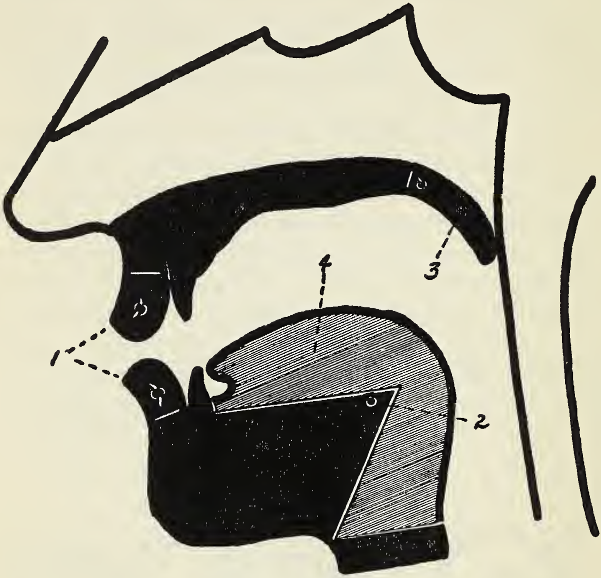



FIG. 22

One-third size reproduction of the cross section chart employed for the development of visual imagery in the New York University Speech Clinic, showing (1) movable upper and lower lips, (2) hinged lower jaw, (3) adjustable soft palate and (4) insertable tongue shape. (Accompanying this chart are twenty-five different tongue shapes corresponding to different tongue positions involved in the production of English speech sounds.)

When the instructor feels that he has given his patient a clear visual image of the articulatory adjustment re-

quired for the production of the standard sound, he should next—

> (3) *develop in the patient the muscular control necessary for the production of the new sound.*

The proper trial-and-error approach to this goal may be best illustrated by an imaginary conversation between instructor and patient—a German patient, let us say, who erroneously substitutes T *as in* TOWN for TH *as in* THIN:

*Instructor.* "You now know what this new sound 'sounds like.' You also know what it 'looks like'—that is, you have watched me adjust my speech mechanism for its production, and in the hand mirror have watched yourself tentatively adjust your own speech mechanism for its production. Incidentally you have carefully examined several diagrams and charts. Now let me hear you produce the sound!"

*Patient.* "I'll try." (Produces a sound which is a slight modification of the old defective sound—something like a distributed T.) "Was that right?"

*Instructor.* "That was close but still it wasn't quite right. Now listen to me once more and watch my mouth closely—note how the tip of my tongue is distinctly visible against the edges of my upper teeth." (Instructor produces standard sound.) "All right—watch yourself in the hand mirror this time and try again."

*Patient.* (Looks in hand mirror closely but only succeeds in producing another distributed T.)

*Instructor.* "No—still not quite right. Listen to me once more." (Instructor again produces standard sound.) "Now this time before you say anything be sure that the tip of your tongue appears against the edges of your upper teeth in the hand mirror. Also concentrate upon the 'feel' of your tongue as it moves forward into position—*get a*

*distinct tactual sensation of the teeth edges pressing against the tongue tip."* [10]

*Patient.* (Produces a sound which is very close to the standard sound.) "How was that?"

*Instructor.* "Much better! Repeat that ten times, still looking in the mirror."

*Patient.* "TH-TH-TH-TH-TH-TH-TH-TH-TH-TH"

*Instructor.* "Another ten times without the mirror, this time concentrating on the *feel* of your tongue in its new position."

*Patient.* "TH-TH-TH-TH-TH-TH-TH-TH-TH-TH"

This trial-and-error drill should enable the patient to achieve in a relatively short time the muscular control necessary for the production of the new sound. If it fails to do this within a reasonable period, the following supplementary measures should be employed:

I. *HAVE THE PATIENT PERFORM LIP, TONGUE, LOWER JAW AND SOFT PALATE EXERCISES CALCULATED TO GIVE THESE ORGANS INCREASED FLEXIBILITY AND HENCE GREATER CAPACITY TO ADJUST THEMSELVES IN NEW POSITIONS.*

Appropriate exercises for this purpose may be invented by the instructor with but a slight exercise of ingenuity.

II. *EMPLOY APPROPRIATE MECHANICAL INTERVENTIONS AND STIMULATIONS AS FOLLOWS:*

[10] It is as necessary to the success of the treatment that the patient "feel" the new sound, as it is that he "see" and "hear" it.

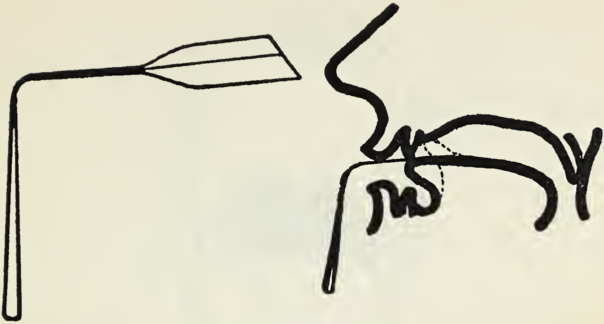


FIG. 23

If the patient stubbornly persists in substituting T *as in* TOWN for TH *as in* THIN and D *as in* DOWN for TH *as in* THEN, hold the blade of his tongue forcibly down in its proper position by means of a wire form. The wire form shown in the accompanying diagram constitutes part of the mechanical equipment of the New York University Speech Clinic and is known as a FRICATOR.

FIG. 24

If the patient persists in substituting TH *as in* THIN for S *as in* SINK and TH *as in* THEN for Z *as in* ZINC, push his tongue back into its proper position with a forked metal brace. The brace shown in the accompanying diagram is known technically as a FRÆNUM FORK.

FIG. 25

If the patient persists in substituting a distributed, "spread" S for a properly occurring concentrated S, and a distributed Z for a properly occurring concentrated Z, give him the tactual sensation of a tongue groove by drawing an ordinary wooden applicator sharply along the median line of his tongue surface.


FIG. 26

If the device described in the previous illustration fails to correct a patient's tendency to spread S sounds, have the patient practise emitting expired breath streams thru a small hole in the under surface of a hollow, hard rubber tube. If this tube (technically known as an S-CONCENTRATOR) is adjusted as indicated in the accompanying diagram, the patient should be able to learn how to produce a properly concentrated S in a relatively short time.

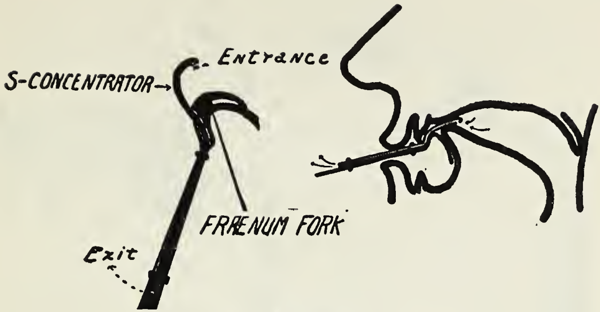



FIG. 27

As a means of correcting an unusually obstinate tendency to spread S sounds, the combined FRÆNUM FORK and S-CONCENTRATOR shown in the accompanying diagram will be found effective.

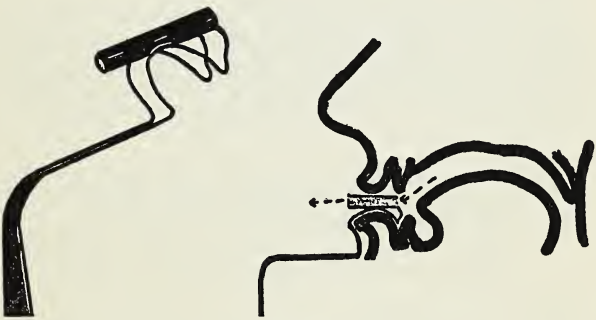


FIG. 28

If the patient persists in substituting V *as in* VINE for W *as in* WATT and F *as in* FINE for WH *as in* WHAT, hold his lower lip forcibly back from occlusion with his upper dentition by means of a curved wire form to which is attached a fairly large cylindrical tube. The latter will force the patient to round and slightly protrude his lips in the manner necessary for the proper production of bilabial fricatives. The apparatus pictured in the accompanying diagram is known technically as a LADATOR.

FIG. 29

If the patient persists in substituting a uvular trill for the English consonant R *as in* ROAR or a guttural L for the English lingua-rugal L *as in* LORE, hold the back of his tongue forcibly down and elevate the blade of his tongue into the desired position by means of a curved wire brace such as that shown in the accompanying diagram. The apparatus pictured above is known technically as a RUVATOR.

## III. *TEACH THE PATIENT THE UNFAMILIAR ARTICULATORY ADJUSTMENT AS THE MODIFICATION OF A LIKE ADJUSTMENT WITH WHICH HE IS FAMILIAR.*

The following examples taken from the methodological records of the New York University Speech Clinic illustrate this method:

(1) If the patient knows how to produce D *as in* DOWN, L *as in* LAKE (an English sound very difficult

for many foreigners) can be taught him as a modification of the former. Have the patient implode an ordinary D and then ask him to release the sides of the tongue rather than the center.

(2) I *as in* WILL (a sound which many foreigners regularly replace with E *as in* WEAL) may be taught as a modification of Y *as in* YOUR. Have the patient produce a prolonged Y and, while he is still producing it, ask him to drop his tongue the barest fraction of an inch.

(3) W *as in* WEAR (a sound which many foreigners regularly replace with V *as in* VINE) can be taught as a modification of OO *as in* BOOT. Have the patient produce a prolonged OO and, while he is still producing it, ask him to move his lips a little closer together.

(4) R *as in* ROAR (a sound of standard English which many foreigners regularly replace with a uvular trill) may be taught as a modification of Z *as in* ZINC. Ask the patient to produce a prolonged Z and, while he is still producing it, have him invert the tip of his tongue slightly and draw it quite free from occlusion with the gums. Or, again, have the patient produce a prolonged A as in STAR and, while he is producing it, invert his tongue sufficiently to produce consonantal friction.

When the instructor, thru trial-and-error drill, mechanical interventions and stimulations, etc., has given his patient the muscular control necessary for the production of the new sound, he should next—

(4) *develop the patient's tentative and uncertain production of the new sound into a firmly rooted speech habit—i. e., transform it from a consciously performed into an automatic act.*

This must be done before the patient can be considered in any sense "cured". To achieve this end the

instructor must impress upon his patient the necessity of faithful, persistent practise. The truth must be borne home to him that even tho he can now produce the new sound perfectly as an isolated phonetic unit, he has yet to introduce it, step by step, into the words of his vocabulary that properly contain it. In this connection the instructor should insist that the patient deliver to him from time to time a fairly lengthy "test" selection, every fourth or fifth syllable of which contains the newly acquired sound. The instructor should also impress upon the patient the necessity of ruthlessly eliminating the old defective sound from his speech—even from colloquial speech with intimate friends.

### (2) FAMILIAR SOUNDS IN UNFAMILIAR POSITIONS

We have noted in the last section one of the most important reasons for the erroneous sound unit substitutions made by the foreigner who tries to learn our language unaided by scientific phonetic instruction—viz., he encounters in spoken English sound units with which he is totally unfamiliar, sound units which he has never heard before and which are not contained in his native language in any position. We have now to consider a second, perhaps equally important reason: he encounters in spoken English a number of sounds which, while familiar to him as phonetic units contained in his native tongue, occupy in English new and unfamiliar positions.

Thus the sound unit Z *as in* ZINC occurs in Italian, Yiddish, Greek, German, Chinese, Jugo-Slav, Swedish and many other foreign languages, but rarely occurs

in these languages in other than initial [12] or medial [12] positions. In English, however, the sound unit Z *as in* ZINC occurs promiscuously in final [12] positions—terminating such common verbs as

| | | | | | |
|---|---|---|---|---|---|
| gaze | does | pays | gives | has | calls |
| says | rise | please | lives | feeds | claims |
| goes | lays | squeeze | moves | blows | throws |
| swims | is | uses | plays | runs | crawls |

such common noun plurals as

| | | | | | |
|---|---|---|---|---|---|
| horses | kittens | houses | rods | laws | parties |
| cows | papers | mayors | yards | places | napkins |
| fleas | tables | cities | heads | days | knives |
| bugs | chairs | pencils | pails | customs | conventions |

and such common pronoun and noun possessives as

| | | | | | |
|---|---|---|---|---|---|
| his | John's | Chicago's | railroad's | California's | bird's |
| yours | Ned's | Denver's | elevator's | Georgia's | dog's |
| theirs | George's | St. Paul's | motor's | Alabama's | lion's |
| hers | Alice's | Albany's | trolley's | Virginia's | animal's |

When a foreigner trying to learn English encounters a Z sound in one of these, to him, impossible final positions,

[12] A sound is said to be *initial* if it begins a syllable (this syllable may or may not begin a word). The following are examples of initial consonants:

| | | |
|---|---|---|
| G *as in* GRADE | D *as in* DO | V *as in* VALE |
| G *as in* UP-GRADE | D *as in* UN-DO | V *as in* PRE-VAIL |

A sound is said to be *medial* if it occurs in the middle of a syllable. The following are examples of medial consonants:

| | | |
|---|---|---|
| R *as in* FRANCE | L *as in* SLOW | S *as in* ASKED |
| R *as in* STRAPS | L *as in* BALK | S *as in* MAST |

A sound is said to be *final* if it ends a syllable (this syllable may or may not end a word). The following are examples of final consonants:

| | | |
|---|---|---|
| G *as in* BIG | D *as in* COD | V *as in* HAVE |
| G *as in* UG-LY | D *as in* COD-FISH | V *as in* AV-ARICE |

he has a natural tendency to substitute for it an acoustically similar sound which he is accustomed to produce in final positions in his native tongue—usually the sound S *as in* SINK. This substitution of S for Z may be noted in such typical utterances of German, Yiddish, Greek, Swedish, Chinese and Jugo-Slav dialect as the following:

GERMAN DIALECT He sess deess tinkss are yourss.
STANDARD ENGLISH *He says these things are yours.*
YIDDISH DIALECT Patroniss Stein'ss Chain Clodingk Storess!
STANDARD ENGLISH *Patronize Stein's Chain Clothing Stores!*
GREEK DIALECT Cigarss! Candiess! Hot dokss!
STANDARD ENGLISH *Cigars! Candies! Hot dogs!*
SWEDISH DIALECT Take deess tingkss to Yohn'ss place.
STANDARD ENGLISH *Take these things to John's place.*
CHINESE DIALECT Sam Lee'ss Laundly washee clothess an' ionss colless.
STANDARD ENGLISH *Sam Lee's Laundry washes clothes and irons collars.*
JUGO-SLAV DIALECT America'ss kohstomss are not eessy for foreignerss.
STANDARD ENGLISH *America's customs are not easy for foreigners.*

The generalization may be safely made at this point that not only final Z sounds but practically all *final tonic consonants* of English speech prove stumbling blocks to the average foreigner who attempts to learn our language unaided by phonetic instruction, since the occurrence of tonic consonants in his native tongue is limited to initial and

medial positions. Hence, on the same basis that he substitutes S *as in* GAS for Z *as in* GAZE, he also substitutes—

| | | | | | |
|---|---|---|---|---|---|
| P | *as in* DRAPE | for | B | *as in* DRAB | |
| F | *as in* SAFE | for | V | *as in* SAVE | |
| T | *as in* MEANT | for | D | *as in* MIND | |
| TH | *as in* KITH | for | TH | *as in* TITHE | |
| S | *as in* FATS | for | Z | *as in* FADS | |
| SH | *as in* ASSURE | for | ZH | *as in* AZURE | |
| CH | *as in* PATCH | for | J | *as in* PAGE | |
| K | *as in* RACK | for | G | *as in* RAG [13] | |

*Treatment.* It is a relatively easy task to correct a sound unit substitution of the character illustrated above. The instructor should first—

> (*1*) *have the patient produce a few words of his native language which contain the desired sound in a familiar position.*

Thus, if the patient is a German immigrant who substitutes HAT for HAD, MINT for MIND, SOT for SOD, etc., the instructor should have him produce such German words as *darin* and *dort*—words of his native tongue which contain the desired sound in initial positions. If the patient is a Spanish immigrant who substitutes LIFF for LIVE, ABUFF for ABOVE, SHUFF for SHOVE, etc., the instructor should have him produce

[13] It frequently happens that after a foreigner has had his attention called to such defects in his speech his dialect becomes for a time worse than ever, the tendency then being for him to substitute not only breathed for voiced consonants but voiced for breathed as well. Thus we often hear in German dialect, for example, such expressions as: "Diz graz iss vet" for "This grass is wet."

such Spanish words as *viva* and *vamos*. If the patient is a Swedish immigrant who substitutes BIK for BIG, BAK for BAG, NAK for NAG, etc., the instructor should have him produce a few Swedish words beginning with G. And so on.

The instructor should next—

> *(2) have the patient lift the desired sound from its acoustic context in these key words and produce it a number of times alone—until he is able to appreciate it as an independent unit.*

The German patient considered in the preceding paragraph, for example, should be asked to isolate the D sound as it occurs in the German words *dort* and *darin* —and then to repeat it several times as follows:

D-D-D-D-D-D-D-D-D-D-D-D-D-D-D

The Spanish patient should be asked to isolate the V sound and to repeat it in the same way:

V-V-V-V-V-V-V-V-V-V-V-V-V-V-V

Similarly, the Swedish patient should be asked to isolate and repeat the G sound:

G-G-G-G-G-G-G-G-G-G-G-G-G-G-G

Following this step, the instructor should—

> *(3) have the patient prefix a series of arbitrarily selected vowels, consonants and nasal resonants to the isolated sound until he becomes accustomed to its occurrence in terminal positions.*

And lastly—

> *(4) have the patient compile for habit formation drill an exhaustive list of standard English words which contain the desired sound in final positions.*

The instructor should then drill the patient on these words, impressing upon him the fact that unremitting practise is imperative if the new speech habit is to be fixed and the erroneously substituted sound eliminated.

### (3) CONFUSING WORD SIMILARITIES

We have noted thus far two of the reasons for the erroneous sound unit substitutions of foreign dialect: (1) *unfamiliar sounds* and (2) *familiar sounds in unfamiliar positions.* We have now to consider a third reason: *confusing word similarities.*

It is a matter of common observation that foreigners encounter in English a number of words which differ so slightly in acoustic content from words of similar meaning contained in their native tongues, that their untrained ears often fail to note any distinction whatever. They therefore, without realization of error, substitute the latter for the former. Examples of this form of phonetic confusion may be noted in such typical substitutions of German dialect as the following:

| | | | |
|---|---|---|---|
| *WAS* | for WHAT | *FUR* | for FOR |
| *WAR* | for WERE | *KANN* | for CAN |
| *BROT* | for BREAD | *VOM* | for FROM |
| *MILCH* | for MILK | *TUR* | for DOOR |
| *GEB* | for GIVE | *HABE* | for HAVE |
| *DING* | for THING | *EIN* | for ONE |
| *ODER* | for OR | *GEH* | for GO |
| *UND* | for AND | *GUT* | for GOOD |
| *GOTT* | for GOD | *NASE* | for NOSE |
| *WEISS* | for WHITE | *HAAR* | for HAIR |
| *PAPIER* | for PAPER | *MIT* | for WITH |
| *PFEFFER* | for PEPPER | *SALZ* | for SALT |
| *APFEL* | for APPLE | *FEUER* | for FIRE |

| | | | |
|---|---|---|---|
| *MORGEN* | for MORNING | *KAFFEE* | for COFFEE |
| *SCHWESTER* | for SISTER | *ONKEL* | for UNCLE |
| *BRUDER* | for BROTHER | *VATER* | for FATHER |
| *SIE* | for SHE | *MUTTER* | for MOTHER |

Other examples of this form of phonetic confusion may be noted in many characteristic substitutions of—

FRENCH DIALECT

Examples—(1) *le* for the, (2) *m'sieur* for mister, (3) *je* for I, (4) *mon* for my, (5) *moi* for me, (6) *idee* for idea, (7) *de* for of, (8) *vous* for you, etc.

SPANISH DIALECT

Examples—(1) *soldatos* for soldiers, (2) *papas* for potatoes, (3) *es* for is, (4) *si* for yes, (5) *le* for the, (6) *fruitos* for fruit, (7) *mucho* for much, (8) *grande* for grand, etc.

SWEDISH DIALECT

Examples—(1) *fran* for from, (2) *ar* for is, (3) *med* for with, (4) *hava* for have, (5) *epitet* for epithet, etc.

NORWEGIAN DIALECT

Examples—(1) *skall* for shall, (2) *du* for you, (3) *har* for have, (4) *med* for with, (5) *fra* for from, etc.

*Treatment.* To correct an erroneous sound unit substitution which has its origin in the confusing similarity of an English to a foreign word, the instructor should—

*(1) carefully direct the patient's attention to the acoustic differences between the English word and the foreign word with which it is confused.*

The instructor may achieve this end by asking the patient to listen critically while he rapidly alternates the produc-

tion of the foreign word and the English word—continuing this exercise for 20 or 30 minutes, if necessary, until the patient is able to note a definite acoustic distinction between the two.[14]

When the instructor has developed in his patient a keen auditory appreciation of the distinction between the foreign word and the acoustically allied English word, he should next—

> (2) *have the patient produce the English word by direct imitation.*

The patient should be able to imitate the instructor's production of the English word with relative ease unless he meets with complications in the form of unfamiliar sounds or familiar sounds in unfamiliar positions. If such complications arise, the instructor must, of course, resort to the measures prescribed in the two preceding sections (see pp. 177–193).

When the instructor has succeeded in teaching his patient the correct production of the English word, he should, finally—

> (3) *give the patient habit formation drills designed to develop his production of the English word from a consciously performed into an automatic act.*

Again the instructor must impress upon the patient the necessity of faithful, persistent practise if the results of the treatment are to be made permanent.

[14] If the instructor has the necessary equipment he may accomplish this same purpose much more deftly and accurately by recording both the English and the foreign word on a record to be subsequently played by a good reproducing machine (see footnote p. 178).

### (4) CONFUSING SPELLING

The foreigner who tries to learn English without scientific phonetic instruction makes many of his most conspicuous sound unit substitutions for a reason which we have not as yet considered—viz., he encounters in written English not only a new [15] but an appallingly complex system of spelling, a system notorious to every student of phonetics for its intricacies and contradictions.

He encounters, for example, such inexcusably confusing orthographic phenomena as the following:

| | |
|---|---|
| knot — not | peek — pique |
| rough — ruff | lie — lye |
| bow — bough | air — heir |
| our — hour | past — passed |
| route — root | for — four |
| so — sew | oar — ore |

Because of orthographic intricacies such as those listed above, our foreign immigrants find it almost impossible—certainly extremely difficult—to enlarge their English speaking vocabularies on the basis of their English reading. When they make the attempt, it is indeed little wonder that we find them making such substitutions as those noted on the accompanying chart.

[15] It should be noted that the *newness* of the English system of orthography, independent of its intricacy, constitutes a stumbling block for the foreigner—since it is no easy matter for him to suddenly discard the rules of orthography governing his native tongue. The German immigrant may, and often does, persistently substitute VISH *for* WISH, VON *for* ONE, VAIT *for* WAIT, etc., in deference to the German orthographic rule: *The letter W has the sound of* V; similarly, the Spanish immigrant may persistently substitute HOKE *for* JOKE, HAIL *for* JAIL, HAM *for* JAM, etc., in deference to the Spanish orthographic rule: *The letter J under certain conditions has the sound of H;* etc., etc.

| Foreign Pronunciation | | English Pronunciation | English Spelling |
|---|---|---|---|
| *dipthong* | for | difthong | DIPHTHONG |
| *wass* | for | waz | WAS |
| *off* | for | ov | OF |
| *hiss* | for | hiz | HIS |
| *rowt* | for | root | ROUTE |
| *cow* | for | coff | COUGH |
| *houssess* | for | houzez | HOUSES |
| *nateeun* | for | nashun | NATION |
| *kistern* | for | sistern | CISTERN |
| *wuld* | for | wood | WOULD |
| *sygen* | for | syn | SIGN |
| *sar* | for | skar | SCAR |
| *skience* | for | sience | SCIENCE |

*Treatment.* To correct sound unit substitutions which have their origin in the bewildering nature of English orthography the instructor should first—

> (*1*) *have the patient learn such rules of English spelling as are helpful—i. e., rules which are neither unduly intricate nor qualified by too many exceptions.*

At the New York University Speech Clinic the following rules have proved useful in this connection:

> (1) When the letter *B* is preceded by *M* or followed by *T* in the same syllable, it is usually silent. (EXAMPLES: lamb, comb, debt, subtle.)
>
> (2) When the letter *C* is followed by *A, O,* or *U,* it usually has the sound of K. (EXAMPLES: accomplish, accuse, cast.) When the letter *C* is followed by *E, I,* or *Y,* it usually has the sound of S. (EXAMPLES: cent, cite, cymbal.)
>
> (3) When the past participle ending *ED* is preceded by an atonic consonant—*P, F, S, SH, CH, K*—it invariably

has the sound of T. (EXAMPLES: stopped, snuffed, passed, gnashed, matched, lacked.)

(4) The letter *P* is silent when it occurs between *M* and *T* in the same syllable. (EXAMPLES: unkempt, Hampton.)

(5) The letter *G* is silent when followed by *N* in the same syllable. (EXAMPLES: sign, gnat, reign.)

(6) When the letter *G* is followed by *A, O* or *U,* it usually has the sound of G *as in* GUN. (EXAMPLES: gate, got, gush.) When the letter *G* is followed by *E* or *I* it may have either the sound G *as in* GUN or J *as in* JUG. (EXAMPLES: get, gesture, gift, gin.)

(7) When *GH* begins a word it has the sound of G *as in* GUN. (EXAMPLES: ghost, ghoul, ghastly); when it ends a word it may be either silent (EXAMPLES: dough, plough, slough) or have the sound of F (EXAMPLES: trough, rough, enough).

(8) The letter *H* is silent when preceded by *R.* (EXAMPLES: rhetoric, rheumatism.)

(9) The letter *K* is silent when followed by *N* in the same syllable. (EXAMPLES: know, knot, knife.)

(10) The letter *L* is often silent when followed by *M* in the same syllable. (EXAMPLES: palm, psalm, calm.)

(11) When *PS* begins a word the letter *P* is always silent. (EXAMPLES: psychology, psychosis, psalm.) When *PN* begins a word the letter *P* is likewise silent. (EXAMPLES: pneumonia, pneumatic.)

(12) The letter *N* is usually silent when preceded by *M* or *L* in the same syllable. (EXAMPLES: condemn, hymn, kiln.)

(13) *QU* practically always has the sound of KW. (EXAMPLES: question, quick, quarry.)

(14) When the endings *TEN* and *TLE* are preceded by *S* or *F,* the letter *T* in these endings is silent. (EXAMPLES: hasten, fasten, thistle, bristle.)

(15) *S* occurring as the final letter of a noun plural has the sound Z when it is preceded by a tonic consonant, a nasal resonant or a vowel (EXAMPLES: fads, songs,

churches); it has the sound S when it is preceded by an atonic consonant (EXAMPLES: sticks, steps).

(16) *TION* has the sound of either SHUN or ZHUN. (EXAMPLES: nation, mission, equation.)

(17) The letter *X* has the sound of either KS [16] or GZ [16] except at the beginning of words when it has the sound of Z. (EXAMPLES: axe, exempt, xylophone.)

(18) *W* is silent before *R* in the same syllable. (EXAMPLES: write, wrought.)

When the patient has mastered such rules of English spelling as are most likely to aid him in the solution of his particular phonetic problems, the instructor should next—

*(2) have the patient undertake the compilation of a phonetic dictionary for purposes of reference and study.*

The compilation of such a dictionary must always supplement the study of orthographic rules, if the latter is to prove practically effective. The instructor should therefore require his patient to secure a pocket-size, loose-leaf note book and to make daily entries as follows:

*Sample Page from Patient's Phonetic Dictionary*

| ENGLISH SPELLING | PHONETIC SPELLING [17] |
|---|---|
| phonograph | fonograf |
| phosphate | fosfate |
| phrase | fraze |
| physician | fizishin |

[16] *X* occurring medially or finally in a word has the sound of GZ rather than KS when it is followed by a primarily accented vowel.

[17] If the patient has difficulty in giving English words proper syllabic stress, he can kill two birds with one stone by using accent marks in his phonetic spellings.

| ENGLISH SPELLING | PHONETIC SPELLING |
|---|---|
| picnic | piknik |
| piquant | peekant |
| pique | peek |
| placid | plassid |
| plague | playg |
| plaid | plad |
| plateau | platoe |
| plead | pleed |
| pleasant | plezant |
| pleasure | plezhure |
| plumb | plum |

In the course of time every orthographically difficult word in the patient's English vocabulary should be entered in his phonetic dictionary as above indicated.[18]

As the last step in the treatment, the instructor should, as usual,

> (3) *give the patient frequent drills designed to develop and permanently fix the new speech habits.*

**Sound Unit Additions and Omissions.** Altho sound unit substitutions are easily the most important manifestations of foreign dialect, and perhaps the most characteristic, sound unit omissions and additions are by no means rare.

In Italian dialect, for example, a number of superfluous sound units are inserted into such expressions as *"deessa mana worka alla day"* whilst a number of properly occurring sound units are dropped from such expressions as *"wassa mat?"* Similarly, in Spanish dialect, superflu-

[18] Much more accurate and systematic phonetic transcriptions can be made if the patient will take the trouble to learn the symbols of the International Phonetic Association.

ous sounds are inserted into such expressions as *"geev me un bowlo soupo"* whilst properly occurring sounds are dropped from such expressions as *"meest"* (for MISTER) and *"ver"* (for VERY).

German, Russian, Scandinavian, French, Greek, Yiddish and other foreign dialects likewise contain expressions characterized by the erroneous omission and insertion of sound units.

*Treatment for Additions.* To correct sound unit additions which occur as manifestations of a foreign dialect, the instructor should—

> (*1*) *have the patient resolve all words of his English vocabulary containing improperly inserted sounds into their constituent elements; then have him produce these elements slowly, one by one.*

Thus, if the patient is an Italian immigrant who says *worka* for WORK, the instructor should have him break up the defective utterance into the sound units W (*as in* WILL), I (*as in* BIRD), R (*as in* ROAR), K (*as in* KATE) and A (*as in* AMID). Similarly, if the patient is a Spanish immigrant who says *soupo* for SOUP, the instructor should have him break up the defective utterance into the sound units S (*as in* SINK), OO (*as in* BOOT), P (*as in* POND) and O (*as in* NOTE).

When this has been done the instructor should next—

> (*2*) *explain which of these elements are superfluous to standard English and require that they be dropped without further ado from the sound sequences into which the patient has been inserting them.*

This step should occasion no difficulty. If the Italian patient has been taught how to resolve *worka* into a se-

quence of separate sound units, he should find it a relatively easy task to follow the instructor's directions, drop the last of these units, and produce *work* instead of *worka.* Similarly, the Spanish patient should be able to follow directions and produce *soup* rather than *soupo,* with little if any difficulty.

The instructor should, finally,—

> (*3*) *fix the results of the treatment by means of persistent habit formation drills.*

*Treatment for Omissions.* The treatment for the omission of sound units is practically the same as that for their addition. The instructor should first—

> (*1*) *have the patient resolve all words of his English vocabulary, from which he erroneously drops sound units, into sequences of their acoustic elements; then have him produce these elements slowly, one by one.*

The instructor should then—

> (*2*) *explain what sound units are missing from these sequences and require in each case that the patient insert them in their proper positions.*

The patient should be able to follow the instructor's directions in this step without trouble unless he encounters complications in the form of:

(a) unfamiliar sounds

(b) familiar sounds in unfamiliar positions

If these obstacles arise the instructor should overcome them by methods previously discussed. (See pp. 177–193).

The instructor should, lastly,—

> (*3*) *fix the results of the treatment by means of persistent habit formation drills.*

**Misplaced Stress.** Foreigners who try to learn English unaided by scientific phonetic instruction are often hopelessly muddled by our system of stress. In all Romance languages (i. e., languages derived from Latin—*French, Spanish, Italian, Roumanian, Portuguese, etc.*) and in many other languages as well, stress tends to fall regularly on the ending of words, while in English it tends to fall with equal regularity on or near the beginning of words.

Because of this fact immigrants to America from many non-English speaking countries commonly commit, when they attempt to "pick up" our language, errors of stress placement such as the following—

| | | |
|---|---|---|
| pres-i-dent′ | for | pres′-i-dent |
| in-ter-est′ | for | in′-ter-est |
| wel-come′ | for | wel′-come |
| phon-o-graph′ | for | phon′-o-graph |
| sub-li-mate′ | for | sub′-li-mate |
| mar-shal′ | for | mar′-shal |
| neu-tral′ | for | neu′-tral |
| hos-pi-tal′ | for | hos′-pit-al |
| min-er-al′ | for | min′er-al |

*Treatment.* To correct errors of misplaced accent which occur as manifestations of a foreign dialect, the instructor should—

> (*1*) *make the patient realize that the system of stress placement in English differs basically from the system of stress placement in his native tongue.*

This fact can be best emphasized thru persistent drill on COMPARATIVE WORD LISTS. The following

charts illustrate the type of lists utilized in this connection at the New York University Speech Clinic:

(*a*) *Comparative Word Lists Emphasizing Distinction between French and English Systems of Stress*

KEY
- French Words—*italic type*
- English Words—Roman type
- Accented Syllables—**heavy type**

| | |
|---|---|
| *sa-**tire*** | *sat-is-**fait*** |
| **sat**-ire | **sat**-is-fy |
| *sau-**cier*** | *schoo-**ner*** |
| **sau**-cer | **schoon**-er |
| *scor-pi-**on*** | *sen-ti-**ment*** |
| **scor**-pi-on | **sent**-i-ment |
| *sep-ar-a-**tiste*** | *si-**lence*** |
| **sep**-ar-a-tist | **sil**-ence |
| *sim-pli-ci-**té*** | *el-e-**ment*** |
| sim-**plic**-i-ty | **el**-e-ment |
| *el-e-**phant*** | *pre-ci-pi-**tant*** |
| **el**-e-phant | pre-**cip**-i-tant |
| *pre-do-mi-**nance*** | *pre-**late*** |
| pre-**dom**-i-nance | **prel**-ate |

(*b*) *Comparative Word Lists Emphasizing Distinction between Spanish and English Systems of Stress*

KEY
- Spanish Words—*italic type*
- English Words—Roman type
- Accented Syllables—**heavy type**

| | |
|---|---|
| *a-bo-mi-**nar*** | *a-bro-**gar*** |
| a-**bom**-i-nate | **ab**-ro-gate |

| | |
|---|---|
| *auth-o-ri-***zar**<br>au-thor-i-ty | *bar-***ril**<br>bar-rel |
| *be-ne-fac-***tor**<br>ben-e-fac-tor | *de-sig-***nar**<br>des-ig-nate |
| *de-ves-***tar**<br>dev-as-tate | *en-un-ci-***ar**<br>e-nun-ci-ate |
| *gra-vi-***dad**<br>grav-i-tate | *guar-di-***an**<br>guard-i-an |
| *il-lu-mi-***nar**<br>il-lu-mi-nate | *ha-bi-tu-***al**<br>ha-bit-u-al |
| *na-tur-***al**<br>nat-u-ral | *mi-ne-***ro**<br>min-er-al |

When the patient has been made to realize that the system of stress in English differs basically from the system of stress in his native tongue, the instructor should next—

(*2*) *accustom the patient to the English system of stress by persistent drill on selected exercises.*

To supplement the purely oral phase of the treatment in this step, the patient should be encouraged to undertake the compilation of a permanent STRESS DICTIONARY —the latter to serve as a basis for reference and study. In this dictionary the patient should enter, with proper accent marks, all words of his English vocabulary which he has a tendency to stress improperly.

*Sample Page from Patient's Stress Dictionary* [19]

progress (*verb*) .......... PRO-GRESS′
progress (*noun*) .......... PROG′-RESS

[19] For a more elaborate dictionary form, to be employed when the patient is confused by the intricacies of English orthography as well as by the English system of stress, see p. 199.

| | |
|---|---|
| prolific | PRO-LIF′-IC |
| promissory | PROM′-IS-SOR-Y |
| propagate | PROP′-A-GATE |
| property | PROP′-ER-TY |
| proposal | PRO-POS′-AL |
| prosecute | PROS′-E-CUTE |
| prostrate | PROS′-TRATE |
| proteid | PRO′-TE-ID |
| protein | PRO′-TE-IN |
| protest (*verb*) | PRO-TEST′ |
| protest (*noun*) | PRO′-TEST |

**Incorrect Intonation.** Immigrants to our country have considerable difficulty in mastering English intonations whenever these are sharply at variance with the intonations of their native tongues. Exceptionally wide variations between the intonations of a foreign language and the intonations of English are frequently responsible for a conspicuous and sometimes quite confusing form of speech defect.

*Treatment.* To remedy intonations of foreign dialect which differ markedly from corresponding intonations of standard English,—

> (*1*) *make the patient hear the acoustic divergence between the intonations of his own speech and the intonations of the instructor's speech.*

This can be done by either of the methods described, p. 178.

After the first step has been successfully concluded—

> (*2*) *have the patient attempt to imitate the intonations of the instructor's speech on the basis of trial-and-error drill.*

Altho the patient cannot be expected to imitate the instructor perfectly on his first attempt, persistent practise

should yield satisfactory results in a relatively short period of time.

To make permanent the results of the treatment the instructor should, finally,—

> (3) *develop the patient's consciously imitated intonations into firmly rooted speech habits.*

## CHAPTER VI

### *DEFECTS OF PROVINCIAL DIALECT*

The characteristic defects of provincial dialect include:

(1) sound unit substitutions
(2) sound unit additions
(3) sound unit omissions
(4) inversions of properly occurring sound unit sequences
(5) defective tone quality

**Sound Unit Substitutions.** Practically every provincial dialect of the United States [1] contains expressions which are characterized by erroneous sound unit substitutions. What tourist of our country has not heard, for example, provincialisms such as those noted on the accompanying chart?

*Provincial Dialect Chart No.* 1

(*Sound Unit Substitutions*)

| SUBSTITUTION | EXAMPLES | | |
|---|---|---|---|
| E *as in* WEAL for E *as in* LESS | *deef* | for | deaf |

[1] The authors will make no attempt to distinguish between the different provincial dialects of the United States. Since there are easily over a hundred such dialects, a discussion of each would involve an expenditure of space obviously disproportionate to the scope of the present text. To the interested reader, however, the authors are glad to recommend *"DIALECT NOTES"*—a philological publication of real merit available at most libraries.

| SUBSTITUTION | | EXAMPLES | | |
|---|---|---|---|---|
| E | *as in* WEAL | *skeer* | for | scare |
| | for | *keerful* | for | careful |
| A | *as in* BARE | *cheer* | for | chair |
| E | *as in* WEAL | *sody* | for | soda |
| | for | *Marthy* | for | Martha |
| A | *as in* AMID | *Minnesoty* | for | Minnesota |
| E | *as in* LESS | *drempt* | for | dreamed |
| | for | *lept* | for | leaped |
| E | *as in* WEAL | *rept* | for | reaped |
| E | *as in* LESS | *ketch* | for | catch |
| | for | *reddish* | for | radish |
| A | *as in* FLAT | *shell* | for | shall |
| E | *as in* LESS | *jest* | for | just |
| | for | *dest* | for | dust |
| U | *as in* STUB | *sech* | for | such |
| E | *as in* LESS | *mebby* | for | maybe |
| | for | *bebby* | for | baby |
| A | *as in* LACE | *leddy* | for | lady |
| E | *as in* LESS | *sence* | for | since |
| | for | *rense* | for | rinse |
| I | *as in* WILL | *red* | for | rid |
| I | *as in* WILL | *git* | for | get |
| | for | *yit* | for | yet |
| E | *as in* LESS | *kittle* | for | kettle |
| I | *as in* WILL | *kivver* | for | cover |
| | for | *jist* | for | just |
| U | *as in* STUB | *sich* | for | such |
| I | *as in* WILL | *rilly* | for | really |
| | for | *crik* | for | creek |
| E | *as in* WEAL | *slick* | for | sleek |
| A | *as in* LACE | *laig* | for | leg |
| | for | *aig* | for | egg |
| E | *as in* LESS | *kaig* | for | keg |

| SUBSTITUTION | EXAMPLES | | |
|---|---|---|---|
| A *as in* LACE | *I-o-way* | for | Iowa |
| for | *Cal-i-forn-i-ay* | for | California |
| A *as in* AMID | *Flor-i-day* | for | Florida |
| A *as in* FLAT | *craps* | for | crops |
| for | *drap* | for | drop |
| O *as in* STOP | *praperty* | for | property |
| A *as in* FLAT | *sassy* | for | saucy |
| for | *hant* | for | haunt |
| A *as in* FLAW | *gant* | for | gaunt |
| A *as in* FLAT | *nap* | for | nape |
| for | *gap* | for | gape |
| A *as in* LACE | *scrap* | for | scrape |
| A *as in* FLAT | *yaller* | for | yellow |
| for | *faller* | for | fellow |
| E *as in* LESS | *fatch* | for | fetch |
| A *as in* FLAT | *gal* | for | girl |
| for | *tarn* | for | turn |
| I *as in* BIRD | *thard* | for | third |
| I *as in* BIRD | *fir* | for | far |
| for | *durn* | for | darn |
| A *as in* STAR | *alurm* | for | alarm |
| I *as in* BIRD | *fir* | for | for |
| for | *first* | for | forced |
| A *as in* FLAW | *ert* | for | ought |
| O *as in* STOP | *stomp* | for | stamp |
| for | *tromp* | for | tramp |
| A *as in* FLAT | *clomp* | for | clamp |
| OO *as in* BOOK | *poor* | for | pour |
| for | *foor* | for | four |
| O *as in* NOTE | *moor* | for | more |
| O *as in* NOTE | *pore* | for | poor |
| for | *shore* | for | sure |
| OO *as in* BOOK | *alloring* | for | alluring |

| SUBSTITUTION | | EXAMPLES | | |
|---|---|---|---|---|
| A | *as in* FLAW | *Gawd* | for | God |
| | for | *lawg* | for | log |
| O | *as in* STOP | *hawg* | for | hog |
| U | *as in* STUB | *suller* | for | cellar |
| | for | *mullon* | for | mellon |
| E | *as in* LESS | *bruth* | for | breath |
| U | *as in* STUB | *muller* | for | miller |
| | for | | | |
| I | *as in* WILL | | | |
| U | *as in* STUB | *ruther* | for | rather |
| | for | | | |
| A | *as in* FLAT | | | |
| U | *as in* STUB | *futher* | for | farther |
| | for | | | |
| A | *as in* STAR | | | |
| N | *as in* STUN | *lenth* | for | length |
| | for | *strenth* | for | strength |
| NG | *as in* SUNG | | | |
| NG | *as in* SUNG | *lemming* | for | lemon |
| | for | *persimming* | for | persimmon |
| N | *as in* STUN | *Menning's* | for | Mennen's |
| N | *as in* STUN | *hern* | for | hers |
| | for | *theirn* | for | theirs |
| Z | *as in* ZINC | *yourn* | for | yours |
| CH | *as in* CHOKE | *Chuhcago* | for | Chicago |
| | for | | | |
| SH | *as in* ASSURE | | | |
| L | *as in* LAKE | *chimley* | for | chimney |
| | for | | | |
| N | *as in* STUN | | | |
| B | *as in* BOND | *fambly* | for | family |
| | for | | | |
| I | *as in* WILL | | | |

| SUBSTITUTION | EXAMPLES | | |
|---|---|---|---|
| Y *as in* YOUR for R *as in* ROAR | *Febyuary* | for | February |
| N *as in* STUN for D *as in* DOWN | *hearn* | for | heard |
| | *rearn* | for | reared |
| | *shearn* | for | sheared |
| O *as in* STOP for E *as in* LESS | *fotch* | for | fetch |
| J *as in* JOKE for D *as in* DOWN | *tremenjus* | for | tremendous |
| | *stupenjus* | for | stupendous |
| | *immejut* | for | immediate |
| D *as in* DOWN for T *as in* TOWN | *pardner* | for | partner |
| T *as in* TOWN for D *as in* DOWN | *holt* | for | hold |
| | *kilt* | for | killed |
| | *helt* | for | held |
| T *as in* TOWN for TH *as in* THIN | *wit* | for | with |
| | *troo* | for | thru |
| | *ting* | for | thing |
| D *as in* DOWN for TH *as in* THEN | *de* | for | the |
| | *deese* | for | these |
| | *dat* | for | that |
| I *as in* PILE for OI *as in* BOIL | *hist* | for | hoist |
| | *bile* | for | boil |
| | *pisen* | for | poison |
| OI *as in* BOIL for I *as in* BIRD | *woild* | for | world |
| | *foist* | for | first |
| | *thoid* | for | third |

**Sound Unit Additions.** Many provincial dialects of the United States contain expressions which are characterized by erroneous sound unit additions.

*Provincial Dialect Chart No. 2*

*(Sound Unit Additions)*

| PROVINCIALISM | | | ADDITION |
|---|---|---|---|
| *this-a-way* | for | this way | A *as in* AMID |
| *detecative* | for | detective | |
| *athalete* | for | athlete | |
| *fillum* | for | film | |
| *ellum* | for | elm | |
| *Henery* | for | Henry | |
| *once't* | for | once | T *as in* TOWN |
| *clost* | for | close | |
| *chanct* | for | chance | |
| *wisht* | for | wish | |
| *idear* | for | idea | R *as in* ROAR |
| *dramar* | for | drama | |
| *lawr* | for | law | |
| *gawrdy* | for | gawdy | |
| *hisn* | for | his | N *as in* STUN |
| *boughten* | for | bought | |
| *twords* | for | to(w)ards | W *as in* WATT |
| *stastistics* | for | statistics | S *as in* SINK |
| *colyum* | for | column | Y *as in* YOUR |
| *dozend* | for | dozen | D *as in* DOWN |

Some provincial dialects contain expressions to which whole syllables are erroneously added:

| | | |
|---|---|---|
| *mischeeveeus* | for | mischievous |
| *municipial* | for | municipal |
| *compulsorary* | for | compulsory |
| *drownded* | for | drowned |
| *simulantaneously* | for | simultaneously |
| *ejjumication* | for | education |

**Sound Unit Omissions.** Many provincial dialects of the United States contain expressions from which properly occurring sound units are omitted.

*Provincial Dialect Chart No. 3*

(*Sound Unit Omissions*)

| PROVINCIALISM | | | OMISSION | |
|---|---|---|---|---|
| *guardeen* | for | guardian | A | *as in* AMID |
| *champeen* | for | champion | | |
| *allus* | for | always | W | *as in* WATT |
| *gunnel* | for | gunwale | | |
| *bangket* | for | banquet | | |
| *sommer* | for | somewhere | WH | *as in* WHAT |
| *summut* | for | somewhat | | |
| *bust* | for | burst | R | *as in* ROAR |
| *fo* | for | four | | |
| *Havad* | for | Harvard | | |
| *yestiddy* | for | yesterday | | |
| *hep* | for | help | L | *as in* LAKE |
| *mysef* | for | myself | | |
| *ah'm* | for | I'm | E | *as in* WEAL |
| *hah* | for | high | | |
| *mah* | for | my | | |
| *teeny* | for | tiny | A | *as in* STAR |
| *snoot* | for | snout | | |

Some provincial dialects contain expressions from which whole syllables are erroneously dropped:

| | | |
|---|---|---|
| *Calina* | for | Carolina |
| *callate* | for | calculate |
| *tarnal* | for | eternal |
| *sasprilla* | for | sarsaparilla |

| | | |
|---|---|---|
| *propty* | for | property |
| *partikally* | for | particularly |
| *considbul* | for | considerable |

**Sequence Inversions.** Still another peculiarity of many of our provincial dialects may be noted in occasional inversions of sound unit sequences. The provincialisms listed below, for example, are familiar to any one who has traveled at all extensively thru the United States:

| | | |
|---|---|---|
| *prespiration* | for | perspiration |
| *preform* | for | perform |
| *prehaps* | for | perhaps |
| *govrenment* | for | government |
| *hunderd* | for | hundred |
| *modren* | for | modern |
| *childern* | for | children |
| *calvary* | for | cavalry |
| *interduce* | for | introduce |
| *Pennslyvania* | for | Pennsylvania |
| *wondred* | for | wondered |
| *lantren* | for | lantern |
| *kinderd* | for | kindred |
| *foundred* | for | foundered |
| *whispred* | for | whispered |
| *thundred* | for | thundered |
| *micerphone* | for | microphone |
| *prespective* | for | perspective |
| *presuade* | for | persuade |
| *frement* | for | ferment |
| *sacerfice* | for | sacrifice |
| *perperation* | for | preparation |
| *repersent* | for | represent |
| *cistren* | for | cistern |
| *culimnation* | for | culmination |

| | | |
|---|---|---|
| *repubilcan* | for | republican |
| *Afirca* | for | Africa |

**Defective Tone Qualities.** Several of our most widely spoken provincial dialects are characterized by defective tone quality. The dialects of our New England states, for example, are characterized by a flat, nasal tone quality; the dialects of New York City, Chicago and other large industrial centers by a "hard-boiled," muffled tone quality; the dialects of certain parts of the middle west by a harsh, raucous tone quality; etc., etc.

**Treatment of Provincial Dialect.** To correct a case of provincial dialect the instructor should—

(*1*) *give the patient a thorough course in the elements of phonetics.*

This course should involve an exposition of all data discussed, pp. 42–125 under the heading "The Sounds of Speech," and should develop in the patient:

(a) the ability to resolve any connected utterance of his own or the instructor's speech into constituent sound units

(b) the ability to differentiate such sound units one from another and to appreciate the characteristic acoustic quality of each [2]

(c) the ability to make phonetic transcriptions—i. e., to translate sound units of spoken language into accurately representative written symbols (preferably into symbols of the *International Phonetic Association*)

[2] A good voice reproducing machine may be utilized to advantage in developing this ability in the patient. Such a machine divorces the sounds of speech from all subjective misconceptions.

As soon as the patient has grasped the fundamental concepts of phonetics, with the results above listed, the instructor should—

> *(2) make the patient discover by his own efforts—on the basis of self analysis and objective comparison—the provincialisms which impair his speech.*

For the accomplishment of this end the patient should be required to make COMPARATIVE PHONETIC ANALYSES of several hundred sample utterances (1) as rendered in provincial dialect by himself and (2) as rendered in standard English by the instructor. The results of these analyses the patient should record carefully in a note-book for study and reference.

The instructor should next—

> *(3) have the patient correct the provincialisms noted in the preceding step on the basis of:*
>
> *(a) direct imitation*
>
> *(b) reference to selected transcriptions of standard English speech*
>
> *(c) application of phonetic rules*

This step should occasion no particular difficulty unless it necessitates that the patient (1) learn an unfamiliar sound, (2) accustom himself to a familiar sound in an unfamiliar position or (3) develop a new tone quality.

If either of the first two complications arises, the instructor should resort to the measures specified, pp. 177–193.

If the third complication arises, the instructor should proceed as follows:

(A) *For the Correction of Nasal Tone Quality.*

(1) Drill the patient on exercises calculated to develop the muscles of the soft palate.[3]

(2) Drill the patient on the production of the sentences—

Jersey cows browse placidly all day.
Walk just half as fast as Ralph.
He dashed out of the house rapidly.

until he can render them with practically the same acoustic effect—(a) with his nostrils closed, (b) with his nostrils open.

(3) Keep the patient interested in his progress by arranging for him to hear his voice from time to time during the treatment as reproduced on a good recording machine.

(B) *For the Correction of Muffled Tone Quality.*

(1) Drill the patient on exercises calculated to develop greater mobility of the lower jaw and lips.[4]

*Suggested Exercises:*

(a) Drop the lower jaw as far as possible and produce a vigorous A *as in* STAR. Elevate it as far as possible and produce a vigorous E *as in* WEAL. Alternate movements 1 and 2 as rapidly as possible.

(b) "Wag" the lower jaw briskly from side to side.

(c) Purse the lips as much as possible. Draw them back tightly against the teeth as in a wide grin. Alternate movements 1 and 2 as rapidly as possible.

[3] Provincially nasal tone quality is due to lassitude of the soft palate—this organ never rising into more than partial occlusion with the pharyngeal wall during the production of supposedly "pure oral" sound units.

[4] Provincially muffled tone quality is due to immobility of the lips and lower jaw.

(2) Keep the patient interested in his progress by arranging for him to hear his voice from time to time during the treatment as reproduced on a good recording machine.

(C) *For the Correction of Harsh Tone Quality.*

(1) Drill the patient on exercises calculated to relax all voluntary muscles of his throat and larynx.

(2) Encourage the patient to take up singing.

(3) Keep the patient interested in his progress by arranging for him to hear his voice from time to time during the treatment as reproduced on a good recording machine.

When the patient has succeeded in correcting all his provincial speech defects, the instructor should, lastly,—

> (4) *fix the results of the treatment by persistent drill on selected exercises.*

The last step cannot be "skipped" if a permanent cure is desired.

## CHAPTER VII

### *DEFECTS OF INFANTILE PERSEVERATION*

The perseveration of infantile habits of speech manifests itself in but two important forms of speech defect:

(1) sound unit omissions

(2) sound unit substitutions

**Sound Unit Omissions.** The following sound unit omissions characteristic of children's speech frequently persevere in the speech of adults:

*Infantile Perseveration Chart No.* 1

(*Sound Unit Omissions*)

| OMISSION | EXAMPLE OF OCCURRENCE | | |
|---|---|---|---|
| L *as in* LAKE | *'ittle* | for | little |
| | *peaz* | for | please |
| | *bow* | for | blow |
| Y *as in* YOUR | *foo* | for | few |
| | *poor* | for | pure |
| | *coot* | for | cute |
| S *as in* SINK | *poon* | for | spoon |
| | *pit* | for | spit |
| | *tand* | for | stand |
| H *as in* HAND | *ooze* | for | whose |
| | *ow* | for | how |
| R *as in* ROAR | *bed* | for | bread |
| | *bake* | for | break |
| | *scape* | for | scrape |

| OMISSION | EXAMPLE OF OCCURRENCE | | |
|---|---|---|---|
| T *as in* TOWN | *lil* | for | little |
| | *pissle* | for | pistol |
| | *sop* | for | stop |

**Sound Unit Substitutions.** The following sound unit substitutions characteristic of children's speech frequently persevere in the speech of adults:

*Infantile Perseveration Chart No. 2*

(*Sound Unit Substitutions*)

| SUBSTITUTION | EXAMPLE OF OCCURRENCE | | |
|---|---|---|---|
| F *as in* FINE | *free* | for | three |
| for | *fink* | for | think |
| TH *as in* THIN | *wif* | for | with |
| V *as in* VINE | *muvver* | for | mother |
| for | *bruvver* | for | brother |
| TH *as in* THEN | *favver* | for | father |
| W *as in* WATT | *wun* | for | run |
| for | *twubble* | for | trouble |
| R *as in* ROAR | *west* | for | rest |
| W *as in* WATT | *wissen* | for | listen |
| for | *pwace* | for | place |
| L *as in* LAKE | *wunch* | for | lunch |
| W *as in* WATT | *wewy* | for | very |
| for | *wenture* | for | venture |
| V *as in* VINE | *womit* | for | vomit |
| TH *as in* THIN | *thikth* | for | six |
| for | *thimple* | for | simple |
| S *as in* SINK | *clath* | for | class |
| TH *as in* THEN | *becauthe* | for | because |
| for | *clothe* | for | close |
| Z *as in* ZINC | *muthle* | for | muzzle |

| SUBSTITUTION | EXAMPLE OF OCCURRENCE | | |
|---|---|---|---|
| S *as in* SINK | *sin* | for | thin |
| for | *sink* | for | think |
| TH *as in* THIN | *wiss* | for | with |
| Z *as in* ZINC | *uzzer* | for | other |
| for | *muzzer* | for | mother |
| TH *as in* THEN | *whezzer* | for | whether |
| S *as in* SINK | *causson* | for | caution |
| for | *sal* | for | shall |
| SH *as in* ASSURE | *sut* | for | shut |
| Z *as in* ZINC | *vizon* | for | vision |
| for | *mesoor* | for | measure |
| ZH *as in* AZURE | *trezzer* | for | treasure |
| T *as in* TOWN | *titten* | for | kitten |
| for | *tayt* | for | take |
| K *as in* KATE | *told* | for | cold |
| D *as in* DOWN | *dess* | for | guess |
| for | *bid* | for | big |
| G *as in* GATE | *udly* | for | ugly |
| Y *as in* YOUR | *yet* | for | let |
| for | *yitti* | for | little |
| L *as in* LAKE | *ayone* | for | alone |

**Treatment of Infantile Perseveration.** To cure a case of infantile perseveration, the instructor should—

(1) *make the patient thoroughly ashamed of his defects.*

Experience has shown that patients who persist in infantile habits of speech often do so deliberately on the assumption that speech infantilisms are, in some mysterious way, "cute." Young women, for example, are often quite frank in numbering speech infantilisms among their feminine charms. The idea here seems to be that in-

fantile mannerisms of speech imply innocence and helplessness, a combination which no male is supposed to be able to resist.

To counteract such notions the instructor should resort to vigorous tho tactfully worded ridicule, supplementing this with logical argumentation in support of adult speech standards. The instructor should next—

> (2) *have the patient correct his defects thru direct imitation of the instructor.*

This step should occasion no particular difficulty unless it necessitates that the patient learn a totally unfamiliar sound—one which he has never produced before in any position, initial, medial or final. In this event the instructor must resort to phonetic explanations, cross section diagrams, mechanical interventions and stimulations and similar measures specified, pp. 177–188.

When the patient's speech infantilisms have been corrected by the methods above noted the instructor should, lastly,—

> (3) *fix the results of the treatment by persistent drill on selected exercises.*

# CHAPTER VIII

## *DEFECTS OF CARELESSNESS*

Two important forms of speech defect characterize the careless speaker:

(1) sound unit substitutions

(2) sound unit omissions

**Sound Unit Substitutions.** All sound unit substitutions peculiar to careless speech result from ASSIMILATION. By this term we designate an unconscious tendency of the careless speaker to subject certain sounds of his speech (usually sounds in weak positions [1]) to the influence of other sounds immediately adjoining them (usually sounds in strong positions [1]) in such a manner that the former are made to more closely resemble the latter. The result of an assimilation is invariably of a character to make the expression in which the assimilation occurs easier to articulate.

If, in careless speech, a sound is subjected to the influence of another immediately preceding it, we speak of *regressive assimilation;* if subjected to the influence of another immediately following it, we speak of *progressive assimilation;* if subjected to the combined influences of

[1] A sound unit is said to be in a weak position if it occurs at the end of a syllable. It occupies a particularly weak position when it occurs at the end of an unstressed syllable. Conversely a sound unit is said to be in a strong position if it occurs at the beginning of a syllable. It occupies a particularly strong position when it occurs at the beginning of a stressed syllable.

sounds which precede and follow it, we speak of *central assimilation.*

All three types of assimilation—regressive, progressive and central—may be noted in the typical utterances of careless speech contained in the following chart.

## *Speech Carelessness Chart No.* 1

(*Sound Unit Substitutions*)

| CARELESS UTTERANCE | | ANALYSIS |
|---|---|---|
| *sumpin* | for something | Regressive assimilation of lingua-dental TH *as in* THIN to bilabial P under influence of antecedent bilabial M. |
| *natchoor* | for nature | Regressive assimilation of lingua-palatal Y to lingua-rugal CH under influence of antecedent lingua-rugal T. |
| *pictchure* | for picture | |
| *literatchure* | for literature | |
| *featchure* | for feature | |
| *det* | for dead | Progressive assimilation of tonic D to atonic T under influence of silence following completion of word. |
| *prospert* | for prospered | |
| *travelt* | for traveled | |
| *unwint* | for unwind | |
| *wim* | for whim | Progressive assimilation of atonic WH to tonic W under influence of subsequent tonic vowel. |
| *wich* | for which | |
| *wen* | for when | |
| *wat* | for what | |
| *proberty* | for property | Central assimilation of atonic P to tonic B under influence of adjoining tonic vowels. |
| *obbortune* | for opportune | |
| *municibal* | for municipal | |
| *praiss* | for praise | Progressive assimilation of tonic Z to atonic S under influence of silence following completion of word. |
| *becauss* | for because | |
| *hiss* | for his | |
| *causs* | for cause | |
| *evervesce* | for effervesce | Central assimilation of atonic |

| CARELESS UTTERANCE | | ANALYSIS |
|---|---|---|
| *univorm* | for uniform | F to tonic V under influence of |
| *spezivicashun* | for specification | adjoining tonic vowels. |
| *ledder* | for letter | Central assimilation of atonic |
| *madder* | for matter | T to tonic D under influence of |
| *ladder* | for latter | adjoining tonic vowels. |
| *muzzle* | for muscle | Central assimilation of atonic |
| *prezedence* | for precedence | S to tonic Z under influence of |
| *pozzible* | for possible | adjoining tonic vowels. |
| *moggery* | for mockery | Central assimilation of atonic |
| *paggage* | for package | K to tonic G under influence |
| *pigging* | for picking | of adjoining tonic vowels. |
| *haf to* | for have to | Progressive assimilation of ton- |
| *uff course* | for of course | ic V to atonic F under influence |
| *luff to* | for love to | of subsequent atonic consonant. |
| *collech* | for college | Progressive assimilation of ton- |
| *privilech* | for privilege | ic J to atonic CH under in- |
| *knowlech* | for knowledge | fluence of silence following |
| *engach* | for engage | completion of word. |
| *op'm boat* | for open boat | Progressive assimilation of lin- |
| *rum back* | for run back | gua-dental N to bilabial M |
| *phome booth* | for phone booth | under influence of subsequent |
| *umbuckle* | for unbuckle | bilabial consonant. |
| *elevem* | for eleven | Regressive assimilation of lin- |
| *sevem* | for seven | gua-rugal N to bilabial M under |
| *heavem* | for heaven | influence of antecedent labio- |
| *evem* | for even | dental V. |

**Sound Unit Omissions.** All sound unit omissions peculiar to careless speech result from ELISION. By this term we designate an unconscious tendency of the careless speaker to simplify his utterances by omitting therefrom all sounds which, because of the character of immediately adjoining sounds, necessitate unusually delicate or difficult articulatory transitions.

A number of different forms of elision may be noted in the typical utterances of careless speech contained in the following chart.

*Speech Carelessness Chart No. 2*

| CARELESS UTTERANCE | | ANALYSIS |
|---|---|---|
| *gimme* | for give me | Omitted V *as in* VINE |
| *lemme* | for leave me | |
| *lumme* | for love me | |
| *deps* | for depths | Omitted TH *as in* THIN |
| *breds* | for breadths | |
| *wids* | for widths | |
| *slep* | for slept | Omitted T *as in* TOWN |
| *crep* | for crept | |
| *genlemen* | for gentlemen | |
| *tol* | for told | Omitted D *as in* DOWN |
| *col* | for cold | |
| *ol* | for old | |
| *secetary* | for secretary | Omitted R *as in* ROAR |
| *libery* | for library | |
| *stenogapher* | for stenographer | |
| *awright* | for all right | Omitted L *as in* LAKE |
| *awready* | for already | |
| *yoursef* | for yourself | |
| *dooty* | for duty | Omitted Y *as in* YOUR |
| *cellaloid* | for celluloid | |
| *regalate* | for regulate | |
| *probaly* | for probably | Omitted B *as in* BOND |
| *reconize* | for recognize | Omitted G *as in* GATE |
| *shooduv* | for should have | Omitted H *as in* HAND |
| *cooduv* | for could have | |
| *wooduv* | for would have | |
| *boundry* | for boundary | Omitted A *as in* AMID |
| *histry* | for history | |
| *battry* | for battery | |

From some utterances of careless speech whole syllables are erroneously dropped:

| | | |
|---|---|---|
| *snuff* | for | that's enough |
| *hado* | for | how do you do |
| *smatter* | for | what's the matter |
| *oozis* | for | who is this |
| *nemmine* | for | never mind |
| *praps* | for | perhaps |
| *guvment* | for | government |

**General Analysis.** In careless speech the mechanisms of assimilation and elision often operate simultaneously. The careless utterances noted on the accompanying chart, for example, are characterized by both substitutions and omissions.

*Speech Carelessness Chart No.* 3

(*Substitutions and Omissions*)

| CARELESS UTTERANCE | | ANALYSIS |
|---|---|---|
| *wozzis* | for what's this | (1) Progressive assimilation of atonic WH to tonic W under influence of subsequent tonic vowel.<br>(2) Elision of T.<br>(3) Central assimilation of atonic S to tonic Z under influence of surrounding tonic vowels.<br>(4) Elision of TH. |
| *gab'm* | for gave him | (1) Elision of H.<br>(2) Elision of I.<br>(3) Progressive assimilation of labio-dental V to bi-labial B under influence of subsequent bi-labial M. |

| | | |
|---|---|---|
| *pungkin* | for pumpkin | (1) Elision of P.<br>(2) Progressive assimilation of bi-labial M to lingua-velar NG under influence of subsequent lingua-velar K. |
| *wag'ng* | for wagon | (1) Elision of O.<br>(2) Regressive assimilation of lingua-rugal N to lingua-velar NG under influence of antecedent lingua-velar G. |
| *zebedder* | for is he better | (1) Elision of I.<br>(2) Elision of H.<br>(3) Central assimilation of atonic T to tonic D under influence of surrounding tonic vowels. |
| *nuttin* | for nothing | (1) Regressive assimilation of lingua-dental TH to lingua-rugal T under influence of antecedent lingua-rugal N.<br>(2) Regressive assimilation of lingua-velar NG to lingua-rugal N under influence of antecedent lingua-rugal T. |

**Treatment of Careless Speech.** To correct a case of careless speech, the instructor should—

(*1*) *convince the patient of the economic, social and cultural value of careful speech.*

This step must be taken in view of the fact that the average careless speaker is quite satisfied with "the way he talks." His friends understand him all right—in fact most of them talk the same way! Why should he be meticulous in his speech when there is no need for it? Why should he talk pedantically when none of his friends do? Why should he strive for careful speech when such

an achievement would be regarded by everyone as a "high-brow" affectation? These arguments the instructor should rebut logically and vigorously, pointing out that—

(a) Careful speech does not exclude the normal informalities of easy conversation—only such grossly careless omissions and substitutions as are (1) *conspicuous,* (2) *confusing* or (3) *unpleasant.*

(b) Careful speech is no more an affectation than is a neat personal appearance.

(c) Careful speech is accepted generally as an index of culture and refinement. It is a "high-brow" affectation only in the opinion of those who aspire to neither culture nor refinement.

(d) Advancement in practically every worth while field of business or professional endeavor is in a large measure dependent upon careful speech.

(e) Among the great majority of educated people, careful speech is a prerequisite for social acceptance.

As soon as the instructor has convinced the patient of the truth of these statements, he should—

*(2) give the patient a thorough course in the elements of practical phonetics.*

This course should include an exposition of all data discussed, pp. 42–125 under the heading "The Sounds of Speech" and should develop in the patient:

(a) the ability to resolve any connected utterance of his own or of the instructor's speech into constituent sound units

(b) the ability to differentiate such sound units

one from another and to appreciate the characteristic acoustic quality of each

(c) the ability to make phonetic transcriptions—i. e., to translate sound units of spoken language into accurately representative written symbols (preferably into the symbols of the *International Phonetic Association*)

The instructor should next—

> (3) *make the patient discover by his own efforts—on the basis of self analysis and objective comparison—the errors of carelessness which impair his speech.*

For the accomplishment of this end the patient should be required to make COMPARATIVE PHONETIC ANALYSES of several hundred sample sentences (1) as rendered carelessly by himself and (2) as rendered carefully by the instructor. The results of these analyses the patient should record in a transcription note book for study and reference.

When all the patient's errors have been noted and transcribed, the instructor should—

> (4) *have the patient correct his errors on the basis of:*
> (*a*) *direct imitation of the instructor*
> (*b*) *reference to selected phonetic transcriptions of careful English speech*
> (*c*) *application of phonetic rules*

This step should occasion little if any difficulty. In the treatment of careless speech the usual obstacles to quick therapeusis—viz., (a) unfamiliar sounds, and (b) familiar sounds in unfamiliar positions—are not encountered.

Before discharging the patient the instructor should, as usual,—

> (5) *fix the results of the treatment by persistent drill on selected exercises.*

So easily does the careless speaker fall from grace after all his errors have been nicely corrected that unusual emphasis must be placed upon this last step. Under no circumstances should it be omitted.

# CHAPTER IX

## *ORGANIC DEFECTS*

Pathologic changes in the actual structure of the speech mechanism may result in—

(1) Nasal Speech
(2) Thick Speech
(3) Harsh Speech
(4) Aphonia

### (1) NASAL SPEECH

We designate as *nasal*—thanks to the ambivalent connotation which this term has acquired—two separate and diametrically opposed types of defective speech:

(a) speech characterized by a PATHOLOGIC DEFICIENCY of nasal resonance—i. e., speech in which the sound units M, N and NG are imperfectly resonated and hence sound "stuffy" and "muffled"

(b) speech characterized by a PATHOLOGIC EXCESS of nasal resonance—i. e., speech in which the vowel and consonant sounds, properly resonated by means of the oral cavity alone, are resonated partly in the oral and partly in the nasal cavity

Type A nasality can be readily distinguished from type B nasality with the aid of a few simple tests:

*Test No. 1.* Have the patient produce the following sentences, prolonging all nasal resonants as indicated—

*Bringngng your songngng and singngng to us.*
*Mmmany mmmen mmmust mmmake mmmoney.*
*Nnnever nnnotice nnnoisy nnneighbors.*

If the nasal resonants in these sentences sound "stuffy" and "muffled," the conclusion may be reached that the patient is suffering from type A nasality—i.e., from a pathologic deficiency of nasal resonance.

*Test No. 2.* Select a sentence the acoustic structure of which is free from nasal resonants. Have the patient render this sentence (1) with his nostrils open, (2) with his nostrils pinched tightly together.

SUGGESTED SENTENCE: *Four score years ago our fathers fought courageously for the political liberty we have today.*

If any of the constituent sounds of this sentence, during its first rendition, sound nasalized—the inference may be drawn that the patient is suffering from type B nasality—i.e., from a pathologic excess of nasal resonance. If the second rendition of the sentence differs markedly from the first in that it seems by comparison "dammed up," the validity of the preceding inference may be considered as definitely established.

To determine whether an excess of nasal resonance inferred on the basis of test number 2 is really an organic defect or merely one of provincial dialect (see page 217), the following supplementary tests should be made:

*Test No. 3.* Seat the patient in a slightly reclining position with his head tilted back and all muscles of his throat and mouth quite relaxed. Ask the patient to drop his lower jaw gently and produce a prolonged A *as in* STAR while he alternately pinches and releases his nostrils. If this pinching and releasing of the nostrils fails to perceptibly modify the acoustic quality of the sound the patient is producing, the conclusion may be safely drawn that the patient's excess nasal resonance is provincial rather than organic. If the pinching and releasing

results in marked modifications of the sound the patient is producing, the conclusion should be drawn that the patient's excess nasal resonance is organic.

*Test No. 4.* Ask the patient to blow with enough vigor to extinguish a lighted match held two feet or so away. While the patient is blowing, hold a polished hand mirror directly beneath his nostrils. If the mirror clouds with expired breath the patient's excess nasal resonance is in all probability an organic defect. If the mirror fails to cloud with expired breath, the patient's excess nasal resonance is in all probability a provincial defect.

**Treatment of Type A Nasality.** If the instructor has established by proper tests that a patient is suffering from a pathologic deficiency of nasal resonance, he should—

(1) *ascertain the causes of this deficiency by careful diagnostic investigation.*

For this investigation the instructor needs the following equipment:

1 nasal speculum
1 laryngeal mirror
1 metal tongue depressor
1 head band with head light and reflector
absorbent cotton and sterilizing apparatus

The *nasal speculum* is an inexpensive but exceedingly useful instrument adapted for opening and enlarging the nostril, thus facilitating examination of the nasal cavity from the anterior aspect. The nasal speculum pictured Fig. 30 is made of spring steel and is so constructed that it will hold itself automatically in place upon introduction into the nostril. It will prove one of the most useful pieces in the instructor's clinical equipment.


Fig. 30
(a) Type of nasal speculum used in the New York University Speech Clinic. (b) Anterior nares, showing nasal speculum introduced into right nostril.

The *laryngeal mirror* is a delicate little instrument which makes possible the inspection of the nasal cavity from the posterior aspect (see accompanying diagram).

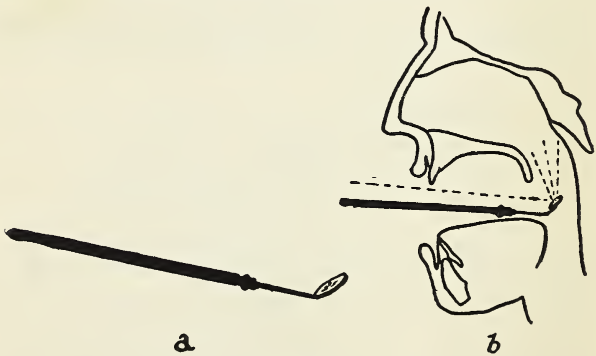



Fig. 31
(a) Type of laryngeal mirror used in the New York University Speech Clinic. (b) Diagrammatic cross section of the upper half of the speech mechanism showing laryngeal mirror in position for posterior inspection of the nasal cavity.

Laryngeal mirrors come in several different sizes. For nasal inspection the smallest size is the most convenient.[1]

During inspection of the nasal cavity from the posterior aspect it is usually necessary to depress the patient's tongue by some mechanical means since this organ has a tendency to "bunch up" and obstruct the examiner's view of the laryngeal mirror. For this purpose the metal tongue depressor pictured below is well suited.[2]

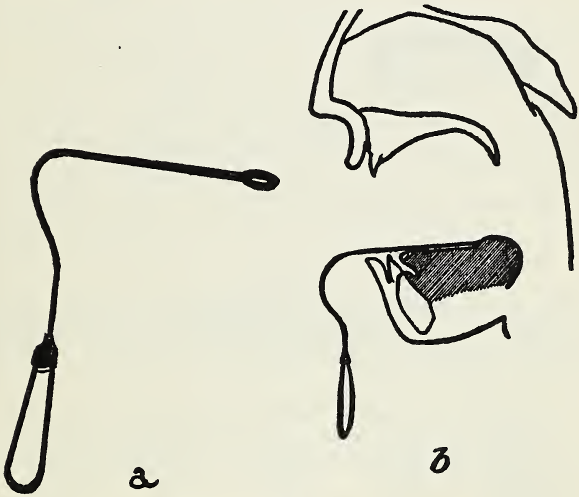



FIG. 32

(a) Type of tongue depressor used in the New York University Speech Clinic. (b) Diagrammatic cross section of the upper half of the speech mechanism, showing tongue depressor in position.

[1] The laryngeal mirror is also used, as its name indicates, for the inspection of the larynx.

[2] An ordinary wooden tongue depressor may be employed for this purpose, provided, of course, a new one is used each time.

The head reflector shown in the accompanying diagram is an ingenious bit of apparatus which makes possible the lighting up of the nasal cavity during both anterior and posterior inspection.[3] Without the artificial illumination provided by this apparatus (or by some similar apparatus) a detailed examination of the dark recesses of the nasal cavity would not be possible.

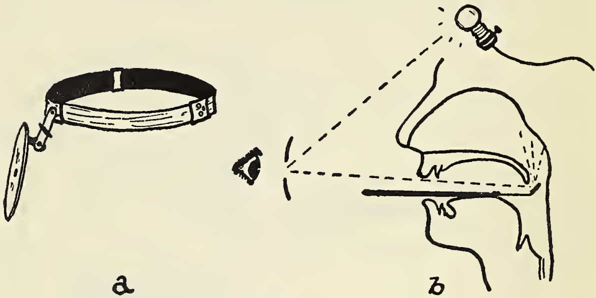



FIG. 33

(a) Type of head-band reflector used in the New York University Speech Clinic. (b) Schematic representation of the principle of reflection involved in the illumination of the nasal cavity from the posterior aspect.

In addition to the equipment just described the instructor should always keep on hand plenty of absorbent cotton together with some means of disinfecting his instruments.

If gas is available in the clinic laboratory, a bunsen burner flame will best answer the purpose. If gas is not available, a good chemical disinfectant will suffice.

[3] This apparatus also lights up the oral, pharyngeal and laryngeal cavities, facilitating inspection of these regions.

### (A) INSPECTION FOR DEVIATE SEPTUM

The instructor should begin diagnostic investigation of a case of type A nasality by inspecting his patient's nasal cavity for *deviate septum*—i. e., for a possible malformation of the thin vertical partition of bone which normally divides the nasal cavity into two equal halves. This inspection should be made as follows:

*Directions.* Notice the general contour of the patient's nose. A "broken nose" usually leaves a thickened or flattened bridge.

Run the thumb and forefinger over the bridge of the patient's nose to test for any irregularities in structure.

Seat the patient in a slightly reclining position, head tilted back. With the aid of a nasal speculum and head light examine the patient's septum as seen thru (1) the left nostril, (2) the right nostril. Note if one half of the patient's nasal cavity is larger than or shaped in any way differently from the other half.

If the instructor discovers from this inspection that the patient's septum deviates markedly from its normal vertical position, or is seriously malformed in any way,


FIG. 34

(a) Normal septum. (b) Septum deviated into "letter S" formation. (c) Septum deviated into right half of nasal cavity with overlapping. (d) Septum deviated into right half of nasal cavity with spur attached. (e) Split septum.

he may properly conclude that such deviation or malformation is partly responsible (perhaps wholly responsible) for the pathologic deficiency in nasal resonance which characterizes his patient's speech.

### (B) INSPECTION FOR NASAL POLYPI

The instructor should continue his diagnostic investigation by testing for *nasal polypi*—i. e., for abnormal growths attached to or imbedded in the walls of the nasal cavity.[4]

*Directions.* Seat the patient in a slightly reclining position, head tilted back. With the aid of a nasal speculum, laryngeal mirror and head light examine from both anterior and posterior aspects, first the left half, then the right half of the patient's nasal cavity—scrutinizing the walls of each half for soft, gray, spongy masses. These masses may be found imbedded in the walls (sessile polypi) or attached to them by stems (pedunculated polypi); they may be no larger than peas or may fill up the entire cavity in which they occur.

Nasal polypi will be most frequently found in the angle of the middle turbinated body, the external wall of the nose and the roof of the nose.

Any abnormal growths discovered as a result of this inspection should be regarded by the instructor as important contributory causes of the patient's impaired nasal resonance. Nasal growths encroach upon the space properly belonging to the nasal cavity and consequently interfere seriously with the latter's function as a resonator.

[4] The nasal polypus is not the only form of abnormal growth to be found in the nasal cavity, but it is by far the most common.

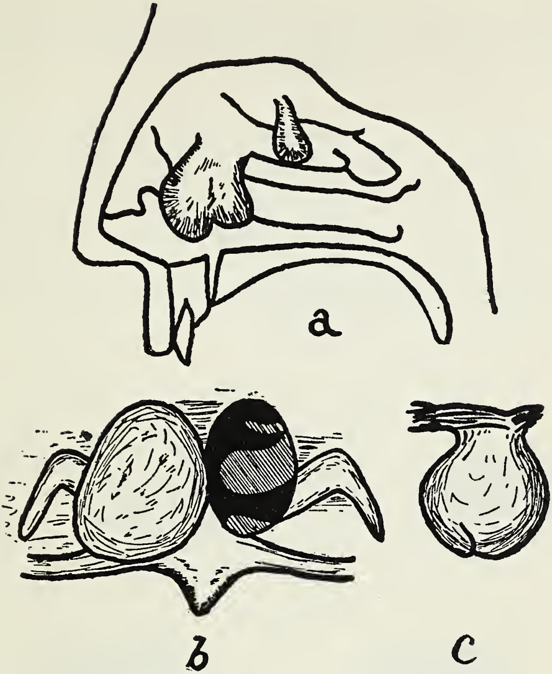



FIG. 35
(*Adapted from McKenzie's* "Diseases of the Throat and Nose")

(a) Polypoid growths attached to the right side wall of the nasal cavity. (b) A nasal polypus viewed from the rear. (Note how this growth bulges thru and completely obscures one of the posterior nares.) (c) A nasal polypus removed with portion of bone to which it was attached.

### (c) INSPECTION FOR HANGING TURBINATES

The instructor should proceed with his diagnostic investigation by examining the patient's nasal cavity for

*hanging turbinates*—i. e., for inflammation of the little folds of mucous membrane which occur in the outside lateral walls of the nasal cavity.

*Directions.* Seat the patient in a slightly reclining position, head tilted back. With the aid of a nasal speculum and head light scrutinize from the anterior aspect (1) the superior, middle and inferior turbinates of the right wall of the patient's nasal cavity, (2) the superior, middle and inferior turbinates of the left wall of the patient's nasal cavity. Examine with especial care the two middle turbinates. These are the ones most likely to be found inflamed.

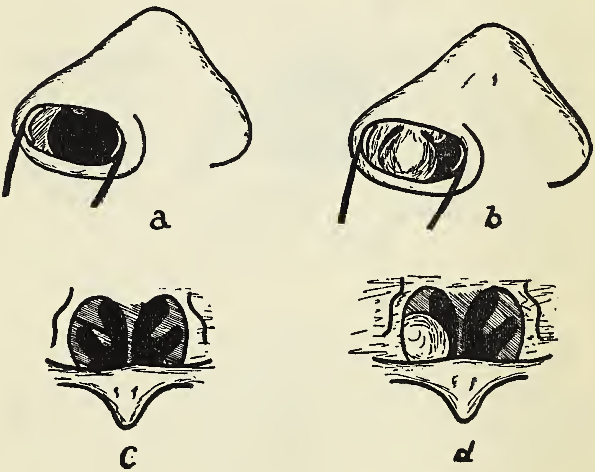



Fig. 36
(a, b) Right side wall of the nasal cavity as viewed from the anterior aspect, showing (a) healthy turbinates and (b) inflamed "hanging" turbinates. (c, d) Nasal cavity viewed thru the posterior nares showing (c) healthy turbinates and (d) inflammatory enlargement of the posterior end of the left inferior turbinate.

If the turbinates are inflamed, their surfaces will probably appear vivid red, shiny and pussy, whilst the turbinates themselves will be distinctly hypertrophied.

Serious inflammation of the nasal turbinates causes them to "hang," hence to encroach upon the space properly belonging to the nasal cavity and to result in a marked impairment of nasal resonance. Obstruction of the nasal cavity from hanging turbinates, it may be noted in passing, is not only an obstacle to effective speech but a serious menace to bodily health as well, since such an obstruction acts as a constant irritant and may result in gradual inflammation of the entire respiratory tract.

### (D) INSPECTION FOR ADENOIDS

The instructor should proceed with his diagnostic investigation by testing for *adenoids*—i. e., for an inflammatory enlargement of the pharyngeal tonsil.[5]

*Directions.* Examine the patient's physiognomy carefully. Adenoids are usually associated with an open mouth, a vacant expression, absence of a pronounced labio-nasal fold, pinched and contracted nostrils, prominent and irregular upper teeth, a sagging and unusually thick lower lip, a short upper lip and a listless expression of the eyes.

Note carefully the patient's carriage and general bodily appearance. If the patient has adenoids, his chest is likely to appear narrow and the tip of his sternum sunken.

Inquire orally into the patient's disposition, intellectual ability, appetite and responsiveness to stimuli. The victim of adenoids is usually characterized by a lack of interest in both

[5] The pharyngeal tonsil is a bunch of small gland-like bodies located in the middle of the roof of the throat just behind the posterior nares and above the soft palate. It is almost identical in structure with that of the familiar FAUCIAL TONSILS visible on either side of the throat within the *isthmus of the fauces.*

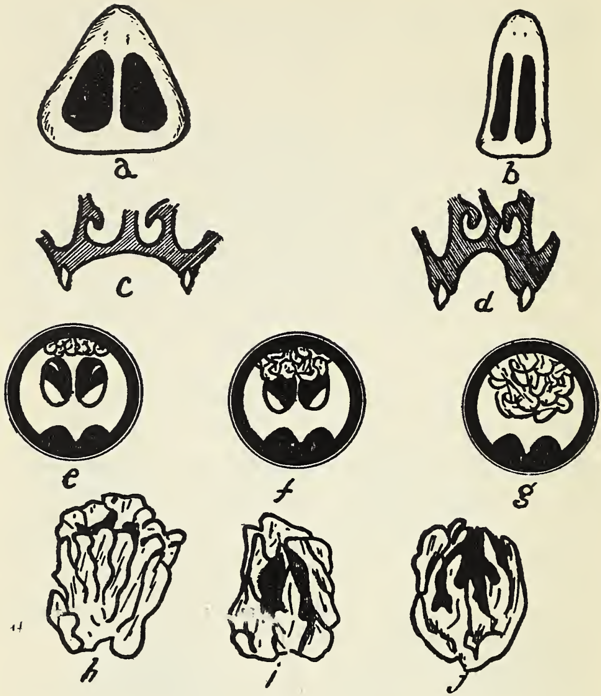



Fig. 37

(*Adapted from Waggett's* "Diseases of the Nose" *and Laurens'* "Oto-Rhino-Laryngology")

(a) Normal nostrils. (b) "Pinched" nostrils commonly associated with adenoids of long standing. (c) Normal palatal arch. (d) High palatal arch commonly associated with adenoids of long standing. (e, f, g) Region of the posterior nares viewed in the laryngeal mirror, showing (e) slight adenoidal vegetation, (f) advanced adenoidal vegetation and (g) profuse adenoidal vegetation completely blocking the nasal exit of the respiratory tract. (h, i, j) Typical adenoidal growths removed.

work and play. Very often his appetite is poor and his sleep restless. As a rule he is mentally dull.

Seat the patient in a slightly reclining position, head tilted back, and require him to open his mouth as wide as possible. Note carefully the contour of the palatal arch. If the patient has adenoids of long standing, his palate will appear unusually high.

With the aid of tongue depressor, laryngeal mirror and head light inspect the patient's pharyngeal tonsil. (*This inspection is by no means easy and should be undertaken only by one adept in the manipulation of the laryngeal mirror. If gagging is to be prevented the instructor must (1) sterilize the mirror in boiling water rather than a chemical disinfectant, (2) warm the laryngeal mirror to the body temperature of the patient and (3) avoid bringing the mirror into contact with the sensitive mucous membrane of the patient's pharyngeal wall.*) The pharyngeal tonsil should appear normally about the size of a very small hazel nut. If inflamed, it will appear much larger. If severely inflamed it may appear to fill up the whole of the patient's nasal cavity.

If the instructor discovers that his patient is suffering from adenoids, he should attribute extreme diagnostic importance to this finding. Perceptible impairment of nasal resonance is sure to result from even a mild case of adenoids.

### (E) INSPECTION FOR NASAL CATARRH

The instructor should conclude an investigation into the causes of type A nasality by testing for *nasal catarrh* —i. e., for general inflammation of the mucous membrane lining the nasal cavity.

*Directions.* Ascertain by oral inquiry whether or not the patient is "bothered" by his nose. If the patient is in an advanced stage of acute nasal catarrh, he will complain of

(1) stuffiness of the nose, (2) frequent attacks of sneezing, (3) a tendency to breathe thru his mouth and (4) a compulsion to use his handkerchief constantly because of profuse nasal exudate. He may further complain, if the exudate from his nose is excessive, of (5) a galling or excoriating of his nose and upper lip.

If the patient is in an advanced stage of chronic catarrh, he will probably complain of a tenacious exudate that occurs in stringy bridges across his nasal cavity. When extracted, this exudate may appear of a greenish color and give rise to an offensive odor.

If the instructor discovers that his patient is suffering from nasal catarrh, either acute or chronic, he should regard this pathological condition as at least a partial determinant of the patient's impaired nasal resonance. The profuse exudate with which nasal catarrh is associated necessarily fills up a good part of the space properly belonging to the nasal cavity and thus seriously interferes with the latter's function as a resonator.

As soon as the instructor has ascertained the causes of his patient's impaired nasal resonance, he should—

> *(2) urge the patient to correct these causes by submitting himself to proper medical treatment.*

*Treatment for Deviate Septum and Hanging Turbinates:*

For the correction of deviate septum and hanging turbinates the patient should be directed to a competent nose specialist. The specialist will remove the deviated portion of the patient's septum by chiseling, resection, grafting, or by some similar method; the hanging portion

of the patient's inflamed turbinate he will remove by clipping.

*Treatment for Nasal Polypi:*

For the elimination of nasal polypi the patient should be urged to submit himself to a surgical operation. The surgeon will remove pedunculated types of polypi with relative ease by means of a snare. Removal of the sessile type calls for a more complicated procedure, since care must be taken to uproot the entire growth in order to prevent its recurrence.

*Treatment for Adenoids:*

If the patient is suffering from an inflamed, hypertrophied pharyngeal tonsil, the diseased organ should be removed by surgical operation. This may be performed by either a nose and throat specialist, or, so simple is the operative procedure, by the patient's family physician. Inasmuch as adenoidal vegetation is as a rule soft, pulpy, poorly supplied with blood-vessels and nerves and but superficially connected with the healthy tissue underneath, it may be scraped away with a dull surgical spoon (*curette*) or curved forceps. Indeed, if adenoids are removed during the first seven years of life, it is hardly accurate to dignify their removal by the term "operation."

*Treatment for Nasal Catarrh:*

If the patient has nasal catarrh he should be referred to a nose and throat specialist. The latter will clear the patient's respiratory tract with sprays and, if possible, *remove the cause of the excess exudate.* In certain

cases of severe chronic catarrh the specialist may be forced to decide that the only hope for a permanent cure lies in a change of climate.[6]

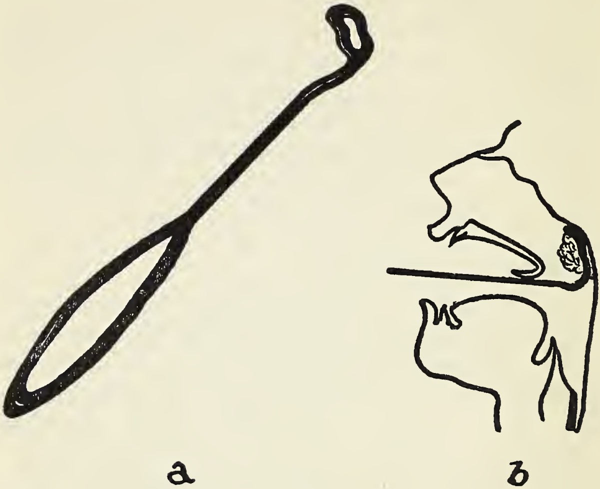



FIG. 38
(*Adapted from Laurens'* "Oto-Rhino-Laryngology")
(a) Typical surgeon's curette. (b) Curette adjusted for removal of an adenoidal growth.

After the patient has completed the medical treatment recommended by the instructor, he should be able to speak with a normal amount of nasal resonance.

**Treatment of Type B Nasality.** If the instructor has established by proper tests that a patient is suffering

[6] Recent experiments seem to indicate that the use of chlorine gas may open the way to a quick and permanent cure of even the most stubborn cases of nasal catarrh.

from a pathologic excess of nasal resonance, he should—

(1) *ascertain the causes of this excess by careful diagnostic investigation.*

For this investigation the instructor needs the following equipment:

1 metal tongue depressor [7]
1 head band with head light and reflector [7]
absorbent cotton and sterilizing apparatus

### (A) INSPECTION FOR CLEFT PALATE

The instructor should begin diagnostic investigation into a case of type B nasality by testing for *cleft palate* —i. e., for a fissure in the roof of the patient's mouth.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open. With the aid of a tongue depressor and head light examine the roof of the patient's mouth from front dentition to uvula. A cleft may appear of almost any form and may range in severity from a slight split in the uvula to a pronounced fissure extending thru both palates, the upper dentition and the upper lip. See Fig. 39.

If the instructor discovers that his patient has some form of cleft palate, he should consider this finding of extreme diagnostic significance. Communication between the oral and nasal cavity via a fissure in the mouth roof inevitably results in the erroneous nasalization of all "pure oral" sound units.

### (B) INSPECTION FOR VELAR INSUFFICIENCY

The instructor should conclude an investigation into the causes of type B nasality by testing for *velar insufficiency*

[7] For a description of this equipment see pp. 237–238.

—i. e., for congenital maldevelopment or paralysis of the muscles of the soft palate.

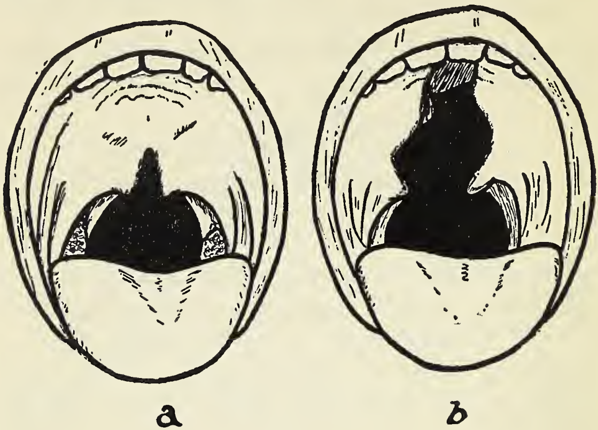



Fig. 39
(a) Typical case of a cleft confined to the velum. (b) Typical case of a severe cleft extending thru both soft and hard palates.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open. Require him to produce a series of "HAH" sounds. With the aid of a head light observe how the patient's soft palate functions during the production of these sounds.

If it rises vigorously in a series of firm occlusions with the pharyngeal wall, all is well.

If it moves sluggishly in a series of partial occlusions with the pharyngeal wall, the patient is probably suffering from *congenital maldevelopment* of the muscles of his velum.

If the patient's velum moves sluggishly and if, in addition, one of its sides is drawn over perceptibly towards the other, the patient is suffering from *unilateral paralysis* of the muscles of the velum.

If the velum does not move at all during the production of the "HAH" sounds, remaining pendulous and apparently lifeless, the patient is suffering from *bilateral velar paralysis*.[8]

If the instructor is unable to decide upon the basis of a visual inspection whether his patient is suffering from a congenital maldevelopment of the muscles of the velum or a bilateral paralysis of the muscles of the velum, he should settle the point by oral inquiry. If the patient states that the pathologic condition of his velum has existed from birth, the instructor should accept the diagnosis of congenital maldevelopment. If the patient states that he acquired the symptom in connection with a "stroke," the instructor should accept the diagnosis of bilateral paralysis.

FIG. 40
A typical case of unilateral velar paralysis.

Any form of velar insufficiency should be regarded by the instructor as an important factor in the causation of

[8] This condition is relatively rare and will seldom, if ever, come to the attention of the speech specialist.

type B nasality. The velum, it will be recalled, functions normally very much like a valve, automatically closing off the nasal cavity from the oral cavity during the production of the majority of English speech sounds. If, because of a pathological enfeeblement, it cannot perform its normal function—nasalization of these sounds is bound to result.

As soon as the instructor has ascertained the causes of his patient's pathologic excess of nasal resonance, he should—

> *(2) urge the patient to correct these causes by submitting himself to proper medical treatment.*

*Treatment for Cleft Palate:*

The treatment for cleft palate depends upon the age of the patient and the severity of the cleft.

A youthful patient suffering from a slight cleft should be urged to submit himself to a surgical operation. The surgeon will place lead anchors on either side of the patient's oral cavity between jaw bone and cheek, connecting these by means of a silver wire that can be shortened by twisting. Using this wire as a brace the surgeon will force the edges of the patient's cleft into intimate contact; these edges he will then revivify (pare) and suture. As the wound heals, the surgeon will gradually loosen the wire brace so that the united tissue of the patient's palate may be accustomed, bit by bit, to the new strain.[9] (See Fig. 41 next page.)

A mature patient suffering from a severe cleft should

[9] This operation is known as *staphyloraphy.*

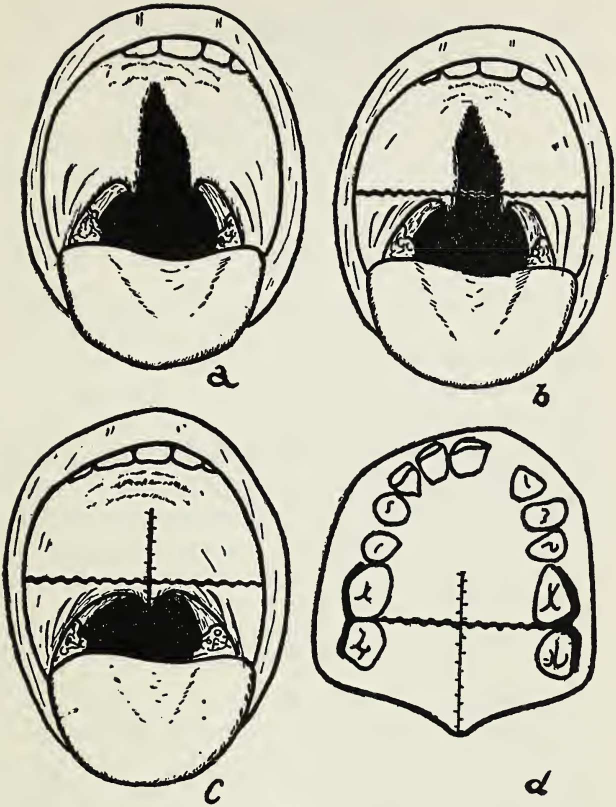



Fig. 41

Diagrammatic exposition of a method of surgical treatment for cleft palate, showing (a) typical cleft, (b) wire brace in position, (c) edges of cleft forced together by brace, revivified and sutured and (d) method of anchoring wire brace.

be referred to a prosthetic dentist rather than to a surgeon. The dentist will "patch up" the patient's cleft by means of an artificial appliance.

*Treatment for Velar Insufficiency:*

If the patient has velar insufficiency he should be referred to a nose and throat specialist. The latter will be quite frank in holding out little hope of a cure but may be able to alleviate the condition somewhat thru electrical treatment and massage.

After the patient has completed the medical treatment recommended by the instructor, his pathologic excess of nasal resonance should decrease. But his troubles do not necessarily cease at this point. In case his treatment has involved the performance of surgical operations or the introduction of artificial appliances, he may find himself confronting a brand new problem—one of speech reëducation.[10] In the latter event the instructor should—

> (3) *assist the reëducative process by* (*a*) *phonetic explanations,* (*b*) *maxillary, labial, lingual and velar gymnastics and* (*c*) *trial-and-error drill.*

## (2) THICK SPEECH

We designate as *thick*—for want of a better term—the speech of a person whose organs of articulation are

[10] A cleft palate patient often mistakenly decides, upon the introduction of an artificial appliance, that as far as speech is concerned he is worse off than ever. While the mechanical appliance has corrected his excess nasal resonance, it has at the same time upset his articulatory equilibrium—i. e., it has made him lose the "feel" of many speech sounds that he formerly had no trouble in producing. These sounds he must set about learning all over again, a reëducative process that often proves not only laborious but extremely difficult.

pathologically enfeebled or malformed. Thick speech is characterized by (a) numerous and gross errors of sound unit substitution,[11] (b) distorted tone quality and (c) general indistinctness.

**Treatment of Thick Speech.** To correct a case of thick speech, the instructor should—

*(1) ascertain the causes of the "thickness" by careful diagnostic investigation.*

For this investigation the instructor needs the following equipment:

1 tongue depressor[12]
1 head band with head light and reflector[12]
absorbent cotton and sterilizing apparatus

### (A) INSPECTION OF THE LIPS

The instructor should initiate investigation into the causes of thick speech by examining the patient's lips for (1) congenital malformation, (2) paralytic enfeeblement and (3) traumas.

*Directions.* Examine the lips carefully, noting their size, contour, color, mobility and the condition of their external tissue.

If an unsightly cleft severs one side of the upper lip (as in Fig. 42—1) or both sides of the upper lip (as in Fig. 42—2), the patient is suffering from a congenital condition known as *hare-lip.*

[11] The sound unit substitutions characteristic of thick speech are not likely to be confused with the sound unit substitutions encountered as symptoms of infantile perseveration, carelessness, provincial dialect or foreign dialect. The ear of the listener will, as a rule, instantly detect the *pathologic quality* of the substitutions peculiar to thick speech.

[12] For description of this equipment see pp. 237 and 238.

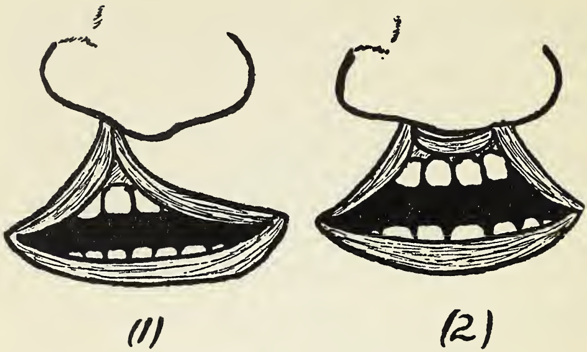


FIG. 42
(1) Typical case of single hare-lip. (2) Typical case of double hare-lip.

If the left halves of both upper and lower lips appear to be drawn over toward the right halves (or vice versa) and if, in addition, the lips appear sluggish in their articulatory adjustments—the patient is suffering from a condition technically known as *unilateral labial paralysis.*[13] This condition is usually found associated with unilateral paralysis of the muscles of the tongue, velum and cheeks.

If either of the lips is badly swollen or scarred, the patient is probably suffering from the results of an accidental injury. An accidental injury to the lips should be noted in diagnostic memoranda under the heading—*miscellaneous labial traumas.*

Any serious pathologic condition of the lips should be regarded by the instructor as an important determinant of thick speech. Enfeebled, malformed, swollen lips cannot properly articulate the consonants—

[13] Bilateral labial paralysis is so rarely encountered that it need not be discussed here. In any event, in the treatment of such a condition motives of speech improvement would be entirely overshadowed by motives of life preservation.

| | |
|---|---|
| WH *as in* WHAT | W *as in* WATT |
| P *as in* POND | B *as in* BOND |
| F *as in* FINE | V *as in* VINE |

neither can they properly shape the oral resonance chamber for the production of the vowels—

| | |
|---|---|
| OO *as in* BOOK | OO *as in* BOOT |
| A *as in* FLAW | O *as in* NOTE |

### (B) INSPECTION OF THE JAWS

The instructor should proceed with his diagnostic investigation by examining the patient's jaws for (1) undershot jaw, (2) overshot jaw and (3) open-bite.

*Directions.* Have the patient close his mouth firmly and draw back his lips as in a wide smile. Note carefully how the upper teeth occlude with the lower.

If the patient's jaws are not malformed, the teeth should occlude as shown in Fig. 43 (1), the upper front teeth (*canines* and *incisors*) just overlapping the lower front teeth, and the upper and lower side teeth (*bicuspids* and *molars*) meeting squarely.

If the lower front teeth project conspicuously beyond the upper front teeth as shown in Fig. 43 (2), the patient is suffering from a malformation known as *undershot jaw.* This malformation is generally associated with an open mouth, a protruding lower lip and an exceptionally prominent chin.

If the upper front teeth project conspicuously beyond the lower front teeth as shown in Fig. 43 (3), rather than snugly overlapping them, the patient is suffering from a malformation known as *overshot jaw.* This malformation is generally associated with an open mouth, conspicuous and partly exposed upper front teeth, pinched nostrils, a high palatal arch and a receding chin.

If the upper teeth fail to meet the lower teeth at all (except at the extreme rear), as shown in Fig. 43 (4), despite the patient's utmost efforts to bring them into occlusion—the patient

is suffering from an exceptionally serious congenital malformation known as *open-bite.* This condition is generally associated with a gaping mouth and a pathologically shortened upper lip.

Serious malformations of either the upper or the lower jaw invariably result in thick speech.

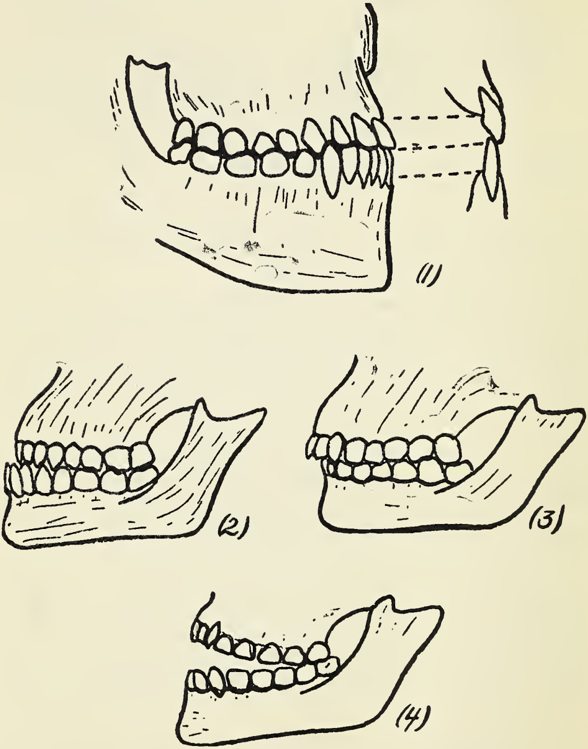



Fig. 43

(1) Normal occlusion of upper and lower dentition. (2) Undershot jaw. (3) Overshot jaw. (4) Open-bite.

Undershot jaw affects particularly the following sounds:

| | |
|---|---|
| F *as in* FINE | V *as in* VINE |
| WH *as in* WHAT | W *as in* WATT |
| P *as in* POND | B *as in* BOND |
| OO *as in* BOOT | OO *as in* BOOK |
| A *as in* FLAW | O *as in* NOTE |

Overshot jaw affects the sounds listed above and the following as well:

| | |
|---|---|
| TH *as in* THIN | TH *as in* THEN |
| S *as in* SINK | Z *as in* ZINC |
| SH *as in* ASSURE | ZH *as in* AZURE |
| T *as in* TOWN | D *as in* DOWN |
| CH *as in* CHOKE | J *as in* JOKE |

Open-bite affects all the sounds of standard English with the possible exception of the open vowels, the nasal resonant NG *as in* SING and the glottal aspirate H *as in* HAND.

### (c) INSPECTION OF THE TEETH

The instructor should continue his diagnostic investigation by examining the patient's teeth for (1) obtrusions, (2) intrusions and (3) edentulations.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open. Push back his lips with the thumb and forefinger and examine his teeth carefully—paying particular attention to the condition of his upper front dentition. (Only the front upper teeth, it will be recalled, figure importantly in the articulatory contacts of English speech.)

Note if any of the front upper teeth are *obtruded* (i. e., bent out of alignment outward) or *intruded* (i. e., bent out of alignment inward).

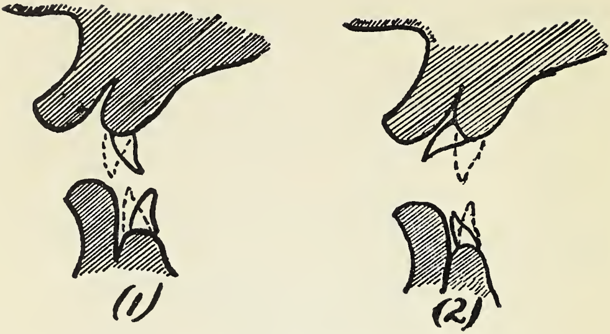



Fig. 44
Diagrammatic cross section of the anterior portion of the oral cavity, showing (1) typical case of dental intrusion and (2) typical case of dental obtrusion.

Note if any of the front upper teeth are missing. Gaps left in the dentition by missing teeth should be noted in diagnostic memoranda under the technical heading—*edentulations.*

If any of the patient's upper front teeth are found to be obtruded, intruded or missing, the instructor should attribute to this finding an important diagnostic significance.

Obtruded front upper teeth may interfere directly with the production of the sounds—

| | |
|---|---|
| F *as in* FINE | V *as in* VINE |
| TH *as in* THIN | TH *as in* THEN |
| S *as in* SINK | Z *as in* ZINC |
| SH *as in* ASSURE | ZH *as in* AZURE |

and indirectly, because they hamper the articulatory movements of the upper lip, with the production of the sounds—

| | |
|---|---|
| WH *as in* WHAT | W *as in* WATT |
| P *as in* POND | B *as in* BOND |
| OO *as in* BOOT | OO *as in* BOOK |
| O *as in* NOTE | A *as in* FLAW |

Intruded front upper teeth and missing front upper teeth, particularly the latter, may interfere directly with the production of the sounds—

| | |
|---|---|
| TH *as in* THIN | TH *as in* THEN |
| S *as in* SINK | Z *as in* ZINC |
| T *as in* TOWN | D *as in* DOWN |

### (D) INSPECTION OF THE TONGUE

The instructor should proceed with his diagnostic investigation by examining the patient's tongue for (1) tongue-tie, (2) paralytic enfeeblement and (3) traumas.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open.

Have the patient thrust his tongue as far forward as he possibly can. The normal tongue should have a "reach" of from 1¼ to 1¾ inches beyond the front dentition. If the patient is unable to project his tongue this distance, note the condition of his frænum—i. e., the little cord which connects the under surface of the tongue blade to the floor of the mouth.

Unless it is malformed, the frænum should be attached to the under surface of the tongue blade at least an inch from the tip. If it is attached any closer to the tongue tip than this, the patient is suffering from a congenital condition known as *tongue-tie.*

Ask the patient to move his tongue briskly about within the mouth. If he is unable to follow this instruction—if, rather, his tongue appears to move sluggishly and one of its sides to be drawn over toward the other, the patient is suffering from *unilateral lingual paralysis.*[14] If this condition exists, the

[14] Bilateral lingual paralysis will never come to the attention of the speech specialist, so rare is its occurrence.

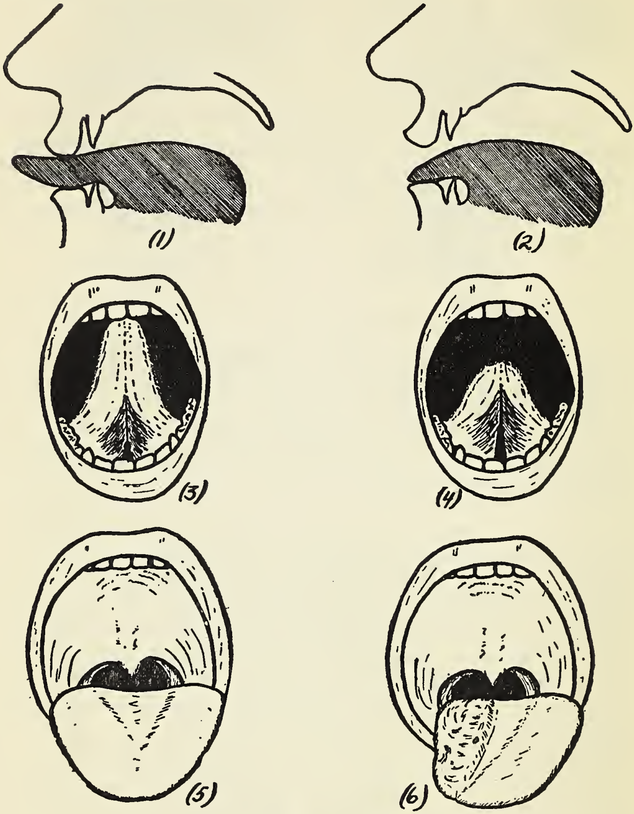



FIG. 45

(1) Average reach of the normal tongue. (2) Average reach of the "tied" tongue. (3, 4) Under surface of the tongue blade as viewed thru the anterior oral orifice, showing (3) normal attachment of the frænum and (4) attachment of the frænum in *tongue tie.* (5) Dorsal surface of a normal tongue. (6) Dorsal surface of a uni-laterally paralyzed tongue.

paralytic side of the patient's tongue will exhibit a grayish, furry coating.

Examine the patient's tongue for miscellaneous traumas—i. e., for cuts, severe scars, swellings, etc.

Pathologic enfeeblement or malformation of the tongue is an important factor in the causation of thick speech. Such a condition has a tendency to affect in particular the following sounds—

| | |
|---|---|
| S *as in* SINK | Z *as in* ZINC |
| SH *as in* ASSURE | ZH *as in* AZURE |
| T *as in* TOWN | D *as in* DOWN |
| CH *as in* CHOKE | J *as in* JOKE |
| R *as in* ROAR | L *as in* LAKE |
| Y *as in* YOUR | N *as in* STUN |
| E *as in* WEAL | I *as in* WILL |

### (E) INSPECTION OF PALATES

The instructor should conclude an investigation into the causes of thick speech by examining the patient's palates (*hard* and *soft*) for (1) high palatal arch, (2) cleft-palate and (3) velar insufficiency.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open.

With the aid of a tongue depressor and head light examine the roof of the patient's mouth. Note if the palatal arch is unusually high. Also note if there is any form of palatal cleft or velar insufficiency [15] (see directions p. 249–p. 251).

A pathologic condition of either the soft or hard palate

[15] The conditions of cleft-palate and velar insufficiency, it will be remembered, are determinants not only of *thick* speech but also of *nasal* speech.

may constitute an important factor in the causation of thick speech.

High palatal arch makes particularly difficult the production of the following sounds:

| | |
|---|---|
| Y *as in* YOUR | R *as in* ROAR |
| E *as in* WEAL | I *as in* WILL |
| A *as in* LACE | E *as in* LESS |

A condition of velar insufficiency interferes particularly with the production of the sounds:

| | |
|---|---|
| K *as in* KATE | G *as in* GATE |

A palatal cleft, in accordance with its size and position, may interfere with the articulation of any or all of the consonant sounds of English speech—possibly excepting the bilabials and labio-dentals.

As soon as the instructor has determined the causes of the patient's thick speech, he should—

> (2) *urge the patient to correct these causes by submitting himself to proper medical treatment.*

*Treatment for Labial, Lingual and Velar Paralysis:*

For the treatment of labial, lingual or velar paralysis the patient should be referred to a neurologist. The neurologist will be quite frank in holding out little hope of a cure but may be able to alleviate the paralytic condition somewhat thru electrical treatment and massage.

*Treatment for Hare-Lip:*

For hare-lip, surgery is the only remedy. The operation involved is a relatively simple one and should always be urged.

*Treatment for Undershot Jaw:*

If the patient is suffering from an undershot jaw, he should be referred to an experienced orthodontist. The orthodontist may be able to correct this condition in a child by simply forcing the protruded maxillary back into its proper place by means of gradual bracing. For the same condition in an adult he can do little or nothing—unless the patient is willing to lose all of his front teeth and submit to the installation of plate dentures.


FIG. 46
Diagrammatic exposition of a method of surgical treatment for undershot jaw in an adult, showing (1) typical case of undershot jaw, (2) the upper and lower front teeth removed and (3) artificial dentures installed.

*Treatment for Overshot Jaw:*

Very little can be done for overshot jaw unless the victim of this condition is placed under the care of a skillful orthodontist early in life. The palatal arch of the youthful patient is usually flexible enough to permit the orthodontist to spread it by means of gradual bracing—thus bringing the patient's upper teeth into a normal relationship with his lower.

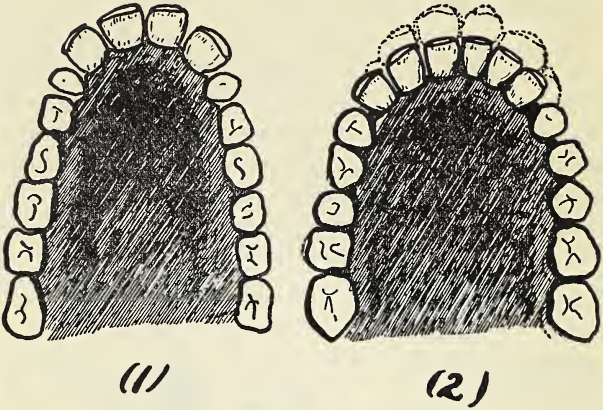



FIG. 47
Diagrammatic exposition of the orthodontic treatment for overshot jaw, showing (1) abnormally projecting upper dentition in a typical case of overshot jaw and (2) retraction of the patient's front upper teeth induced thru forced spreading of the palatal arch.

*Treatment for Open-bite:*

Open-bite can be corrected in a child by means of a fairly simple surgical operation, but in an adult defies all but the most radical treatment—treatment so radical that it should never be advised for purposes of speech improvement alone.

*Treatment for Obtruded and Intruded Teeth:*

If the patient has badly obtruded or intruded front upper teeth, he should be referred to a competent surgeon dentist. The latter will usually extract one or two of the patient's teeth, if "crowding" has been the source of difficulty, and bring the rest of the teeth back into alignment

thru a process of gradual bracing. If bracing is impossible, due to the patient's age,[16] the dentist will replace the unaligned teeth with artificial dentures.

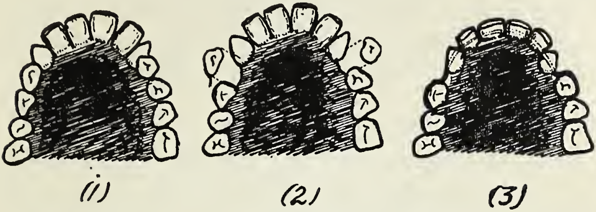



FIG. 48
Dentition of the upper jaw viewed from below showing (1) badly obtruded incisors and canines, (2) front bicuspids extracted to make room for readjustment of obtruded incisors and canines and (3) obtruded incisors and canines braced back into normal position.

*Treatment for Edentulations:*

If any of the patient's front upper teeth are missing, he should be urged to consult a dentist for the installation of artificial dentures—provided, of course, the missing teeth are from the patient's PERMANENT DENTITION. The dentist will select from the following three types of artificial dentures the one best suited to the exact nature of the patient's edentulation:

(1) crowns
(2) bridges
(3) plate dentures

*Treatment for Tongue-tie:*

Tongue-tie can be corrected by a very simple surgical operation. The surgeon will merely "nip" enough of the

[16] Neither permanent nor satisfactory results are ordinarily obtained from dental bracing in patients over 20 years of age.

patient's frænum to give the tongue blade its proper freedom.

*Treatment for Miscellaneous Lingual and Labial Trauma:*

For severe injuries to the tongue and lips the patient should be referred to a surgeon. In the case of severe labial injuries the latter may resort to skin grafting.

*Treatment for High Palatal Arch:*

A high palatal arch can be corrected in a child by means of forced spreading. In an adult little or nothing can be done for this condition—except to teach the patient how to compensate for it by increased lingual activity.

*Treatment for Cleft Palate and Velar Insufficiency:*

The treatment for cleft palate and velar insufficiency has been discussed in connection with NASAL SPEECH. (See pp. 252–254.)

After the patient has completed the medical treatment recommended by the instructor, the "thickness" in his speech should largely disappear. In case surgical revisions of the patient's articulatory apparatus have been so extreme as to create an additional problem of speech reëducation, the instructor should—

> (*3*) *assist the reëducative process by* (*a*) *phonetic explanations,* (*b*) *labial, lingual and velar gymnastics and* (*c*) *trial-and-error drill.*

## (3) HOARSE SPEECH

We designate as *hoarse,* speech which is unpleasant to the ear because of a coarse, husky, raucous, "graty," harsh or "stringy" tone quality.

**Treatment for Hoarse Speech.** To correct a case of hoarse speech the instructor should—

> (*1*) *ascertain the causes of the patient's hoarseness by careful diagnostic investigation.*

For this investigation the instructor needs the following equipment:

1 tongue depressor [17]
1 head band with head light and reflector [17]
1 laryngeal mirror [17]
absorbent cotton and sterilizing equipment

### (A) INSPECTION FOR UVULAR ELONGATION

The instructor should begin the diagnostic investigation of a case of hoarse speech by testing for *uvular elongation*—i. e., for a pathologic extension of the tip of the patient's soft palate.

*Directions.* Seat the patient in an upright position, head tilted slightly back, mouth open, all muscles of the throat and mouth entirely relaxed. Ascertain by visual inspection how far down the tip of the patient's velum hangs. Normally the uvula should appear as shown Fig. 49 (1). If pathologically elongated it will impinge upon the back of the tongue—as shown Fig. 49 (2).

Ask the patient if he is bothered by a tickling sensation in his throat when he lies down. If he has uvular elongation he will probably answer in the affirmative. A pathologically extended uvula travels back and forth over the pharyngeal surface during prone respiration and hence gives rise to an irritating, tickling sensation. In connection with this sensation the patient may complain of a compulsion to cough and swallow constantly.

[17] For a description of this equipment see p. 236–238.

An elongated uvula may be an important determinant of the patient's hoarseness because of its tendency to inflame by irritation the mucous membrane lining the pharyngeal wall. Inflammation of this membrane interferes with the function of the pharynx as a resonator and hence robs the patient of the rich, full tone quality that should normally characterize his speech.


FIG. 49
The oral cavity viewed from the anterior aspect showing (1) a normal uvula and (2) a pathologically elongated uvula.

(B) INSPECTION FOR HYPERTROPHIED TONSILS

The instructor should proceed with his diagnostic investigation by examining the patient for *hypertrophied tonsils*—i. e., for an inflammatory enlargement of the glandular bodies visible on either side of the patient's throat within the isthmus of the fauces.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open. With the aid of a tongue depressor and head light note the color, size and general condition of the faucial tonsils.

Normally these should appear as small pinkish bodies, barely distinguishable against the side walls of the throat. If inflamed, they will be of a vivid red color and may appear as

large as good sized walnuts. If severely inflamed (as in *quinsy* or *tonsilitis*) they may be covered with a pussy exudate.

Inflamed, hypertrophied faucial tonsils encroach upon the space properly belonging to the oro-pharyngeal cavity and seriously impair the latter's capacity for resonance. They should therefore be regarded as important factors in the causation of hoarseness.

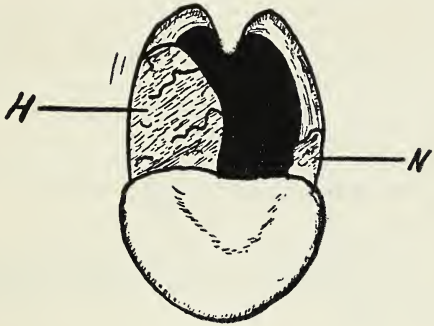



FIG. 50
The oral cavity viewed from the anterior aspect showing (N) a normal faucial tonsil and (H) an inflamed, hypertrophied faucial tonsil.

### (C) INSPECTION FOR PHARYNGITIS

The instructor should continue his diagnostic investigation by testing for *pharyngitis*— i. e., for general inflammation of the mucous membrane which lines the patient's throat.

*Directions.* Ask the patient if his throat "bothers" him. If he has pharyngitis he will probably complain of a compulsion to hawk continually in an effort to clear the pharyngeal

cavity. He may also complain of impaired hearing, pain in swallowing and a slight difficulty in breathing.

Seat the patient in a slightly reclining position, head tilted back, mouth open. With the aid of a tongue depressor and head light note the color and general appearance of the walls of the patient's throat. If the patient is in an advanced stage of acute or chronic pharyngitis, the walls of his throat will appear fiery red in color and covered with a scaly or pussy exudate.[18] This exudate will be yellowish or yellowish gray and may give rise to an offensive odor.

Ascertain by inspection (see page 245 for directions), or by reference to memoranda of previous findings, whether or not the patient has *nasal catarrh.* This condition will almost invariably be found associated with pharyngitis. Indeed, the former may be regarded as the immediate cause of the latter, since nasal exudate has a natural tendency to gravitate and thus to spread infection to underlying regions of the respiratory tract—to the throat, larynx, trachea, and even to the bronchi and lungs.

Severe inflammation of the walls of the pharynx so impairs speech resonance that some form of hoarseness inevitably results.

### (D) INSPECTION FOR LARYNGITIS

The next step in the instructor's diagnostic investigation should be a test for *laryngitis*—i. e., for general inflammation of the mucous membrane which lines the patient's larynx.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open. With the aid of a tongue depressor, head light and laryngeal mirror carefully examine the patient's vocal chords.[19] If in a healthy condition, these will

[18] A pussy exudate is generally associated with acute pharyngitis, a scaly exudate with chronic pharyngitis.

[19] Only one adept in the manipulation of a laryngeal mirror should attempt to make this examination.

appear pearly white in color. If inflamed, as will be the case if the patient has laryngitis, they will appear reddish or pinkish in spots.

Ascertain by oral inquiry if the patient suffers from pains and tired feelings in his throat. Laryngitis is commonly associated with these symptoms. It is also commonly associated with an uncertain, altered voice pitch.

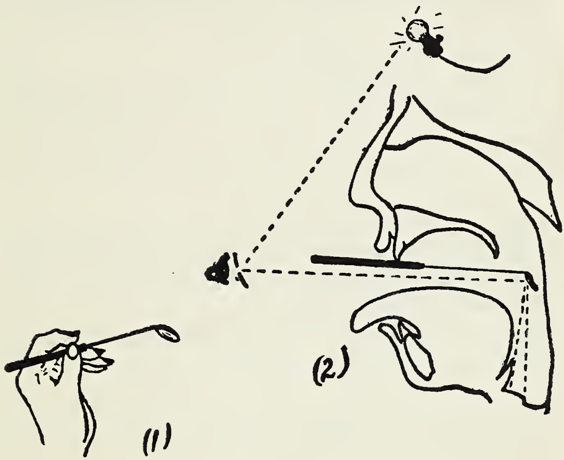



FIG. 51
Diagrammatic exposition of the principle of laryngoscopy showing (1) correct method of holding the laryngeal mirror and (2) laryngeal mirror in position for inspection of the larynx and vocal chords.

Laryngitis is an important factor in the causation of hoarseness for two reasons:

(1) it impairs the resonance of the laryngeal cavity

(2) it interferes with the free vibration of the vocal chords

### (E) INSPECTION FOR SINGER'S NODULES

The instructor should conclude the diagnostic investigation of a case of hoarse speech by testing for *singer's nodules*—i. e., for abnormal growths on the vocal chords.

*Directions.* Seat the patient in a slightly reclining position, head tilted back, mouth open. With the aid of a tongue depressor, head light and laryngeal mirror examine closely the inner edges of the vocal chords.

If in a healthy condition, these will appear perfectly smooth. If the patient has singer's nodules, they will appear studded with small swellings. The latter may appear no larger than pin heads or as large as good sized peas and may range in color from reddish to pure white.[20]

Singer's nodules play an important part in the causation of hoarseness because they make impossible the proper vibration of the vocal chords.

As soon as the instructor has ascertained the causes of the patient's hoarseness he should—

> (2) *urge the patient to correct these causes by submitting himself to proper medical treatment.*

*Treatment for Uvular Elongation:*

For chronic uvular elongation surgery is usually the remedy. The surgeon will probably operate as noted in Fig. 52.[21]

[20] When singer's nodules first appear, they are reddish in color; later they turn white.

[21] This operation should be advised only in cases where the patient's uvula remains unduly elongated after the inflammations responsible for its elongation have disappeared.

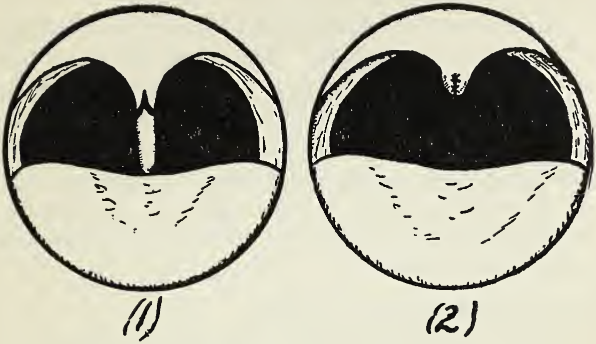


Fig. 52
Diagrammatic exposition of Casselbury's operation for uvular elongation showing (1) lower portion of uvula removed by V-shaped incision and (2) edges of wound drawn together and sutured.

*Treatment for Hypertrophied Tonsils:*

If the patient has seriously inflamed faucial tonsils, he should be referred to his family physician without delay. The physician will attempt to remove the cause of the inflammation, or, if he deems the success of such an attempt doubtful, remove the patient's faucial tonsils entirely by surgical operation.[22]

[22] This operation should not be performed without due deliberation. Contrary to general belief the tonsils are useful parts of the human anatomy and should be removed only if really necessary. According to Faulkner the tonsils act as acoustic cushions in speech production. They also serve to protect a large vein which, were it not for their presence, might easily be cut by a bone or some other sharp substance pressing against the pharyngeal wall during the act of deglutition.

*Treatment for Pharyngitis and Laryngitis:*

If the patient is suffering from a general inflammation of the mucous membrane which lines his throat and larynx, he should be referred to a nose and throat specialist. The latter will alleviate the inflamed condition as far as possible by means of sprays and then institute treatment calculated to *remove its cause.*[23] In severe cases of chronic pharyngitis and laryngitis the specialist may decide that the only hope of a cure lies in a change of vocation or of climate.[24]

*Treatment for Singer's Nodules:*

Singer's nodules should be given local treatment by a nose and throat specialist. While he is administering this treatment, the specialist will probably forbid the patient to use his voice—recommending that the laryngeal muscles be kept "in trim" in the meanwhile by exercises in soundless speech. The specialist will operate only as a last resort.

When the patient has been cured of his nodules by medical treatment, the instructor should teach him the proper use of his voice. Singer's nodules are almost always due to straining of the voice from abnormal, misdirected tension of the extrinsic muscles of the larynx. Unless the patient is taught how to relax these muscles while speaking, the nodular condition of his vocal chords will probably recur.

[23] This is often found to be a pathologic condition of the nasal cavity. As has been mentioned elsewhere, the exudate from an inflamed nasal cavity tends to gravitate and thus to spread infection to the underlying regions of the respiratory tract.

[24] Such vocations as locomotive engineering, chemical laboratory work, machine grinding, etc., subject the delicate mucous membrane lining the respiratory tract to constant irritating influences.

After the patient has completed the medical treatment recommended by the instructor, the hoarseness in his speech should disappear.

## (4) APHONIA

Without doubt the most alarming of all known speech defects—albeit one seldom encountered—is *aphonia,* i. e., complete loss of the voice. This condition may be caused by: [25]

(1) acute laryngitis

(2) extreme weakness of the muscles of the larynx following an exhausting illness

(3) laryngeal paralysis

**Treatment for Aphonia.** The instructor should not attempt to examine a patient suffering from aphonia but should refer him at once to a competent physician.

In the case of aphonia from acute laryngitis, the physician will institute measures calculated to cure the latter condition.

In the case of aphonia from extreme weakness of the laryngeal muscles following an exhausting illness, the physician will recommend an unworried toleration of the condition until it automatically disappears during the course of convalescence.

In the case of aphonia from paralysis the physician will resort to electrical treatments and massage.

[25] This defect is not always organic, occasionally occurring as a symptom of psychoneurosis. See p. 286.

# CHAPTER X

## *NEUROTIC DEFECTS*

A functional nervous disturbance may cause the following defects of speech:

(1) Stammering
(2) Level Intonation
(3) Aphonia

### (1) STAMMERING

A person is said to "stammer" [1] when his speech is impaired by—

(*1*) *pathologic retardations*
*Example:* What a . . . (pause during which patient struggles for utterance of next sound unit) . . . big . . . (another pause during which patient again struggles for utterance) . . . boy is . . . (still another pause) . . . Bob!

(*2*) *pathologic repetitions*
*Example:* D-d-d-did you w-w-w-want me to g-g-g-go away?

(*3*) *pathologic accelerations*
*Example:* Juwanmeegoway? (*for*) Did you want me to go away?

(*4*) *pathologic prolongations*
*Example*: NNNNever mmmmind wwwwaiting ffffor mmmme.

[1] In the authors' usage of this term, "stammering" is synonymous with "stuttering."

(5) *the frequent use of "starters"*

*Example:* Now-now this now-country is inhab-now-now inhabited by now-Asiatics.

The acoustic peculiarities of the stammerer's speech noted above are usually associated with the following physiological and psychological abnormalities—

(1) *cramps and spasms of the muscles of respiration during speech*

(2) *cramps and spasms of the muscles of the larynx during speech*

(3) *cramps and spasms of the muscles of the soft palate during speech*

(4) *cramps and spasms of the muscles of the tongue during speech*

(5) *cramps and spasms of the muscles of the lips during speech*

(6) *cramps and spasms during speech of miscellaneous muscles not ordinarily associated with speech production* [2]

(7) *dread of speaking*

(8) *dread of speaking under certain special circumstances, e. g., before persons of authority, to strangers, over a telephone, from a public platform, to members of the opposite sex, etc.*

(9) *dread of speaking certain particular sound units, words, or phrases*

(10) *pathologic feelings of inferiority*

(11) *general over-anxiety*

(12) *neurotic character traits* [3]

(13) *miscellaneous psychoneurotic symptoms* [4]

[2] During speech production the stammerer will frequently grimace and contort his entire body—thrusting out his tongue, screwing up his eyes, clenching his fists, twisting and stamping his feet, etc., etc.

[3] See list of neurotic character traits, Form 9, p. 155.

[4] See list of psychological and physiological indices of functional nervousness, Form 9, pp. 155–156.

**Cause of Stammering.** The symptoms of stammering arise as the direct or indirect result of the nonabsorption of certain mental processes into the main stream of consciousness. Certain desires occur to the patient which the latter must not only refuse to gratify but which, in deference to the dictates of a hypertrophied moral conscience, he feels he must refuse to acknowledge as a true part of his personality. Instead of healthily acknowledging their presence and then dealing with them by either gratification or control according to the circumstances of the case, he fails to assimilate them, pretends to himself that they are not there, tries to submerge them, to forget them or—to use the technical term by which the process of purposeful forgetting is designated—to *repress* them. These repressed desires then take on an automatous existence in the patient's unconscious mind and act as irritating foreign influences in much the same way as do physical foreign bodies which are not properly absorbed by the digestive system. Thus the symptoms of stammering—along with all other psychoneurotic symptoms—must be regarded as results of psychic malassimilation—psychic "indigestion."

A significant characteristic of the psychoneurotic symptom is that it attains a certain unconscious gratification for the repressed desire with which it is causally related—i. e., that it represents a distorted, cryptogrammatic expression of the repressed desire—a *fulfillment* of it thru the medium of symbolism. From this standpoint the symptoms of stammering may be considered to constitute a code language thru which wishes repressed in the patient's unconscious mind find the only means permitted them of coming to expression.

Anxiety, which plays so important a part in the symptomatology of stammering, must be interpreted as the patient's *fear of himself*—of the perverse, incestuous, criminal and asocial desires which he has clamped down in the cellar of his mind. It is the fear of inadvertently revealing the presence of these hidden desires thru speech that is responsible in a large measure for the stammerer's malady. The case here, therefore, is one of fear, as an inhibitory idea, checking the course of a normally automatic function.

**Treatment for Stammering.** Wherever circumstances permit, the stammerer should be referred to a skilled psychanalyst for treatment. The latter will endeavor to cure the stammerer's malady—

(1) by discovering the nature of the buried mental processes in which his patient's disease symptoms are rooted

(2) by making the patient aware of these processes thru analysis of dreams and the resuscitation of infantile memories

(3) by promoting a normal, harmless discharge (*abreaction*) of the pent-up emotions attached to these processes

(4) by rendering these processes, thru explanation and discussion, more assimilable with the main body of the patient's personality

The psychanalyst endeavors to cure the stammerer's malady, in short, *by reversing the pathologic process of repression responsible for the malady's causation.*

William Stekel, the internationally reputed Viennese neurologist, epitomizes the psychanalytic method just described in the following words:

"In psychanalysis we open the graves of buried desires. Out of them spring wild passions, as from Pandora's box. But these cannot stand the light of day. They fade and die, never to appear again. *It is only the repressed thought that can lastingly disturb the equilibrium of the soul.*"

The psychanalytic treatment for stammering yields satisfactory results in the great majority of cases and is the only system of therapeusis that holds out the promise of a scientific, permanent cure. Its most important disadvantages lie in—

(1) the difficulty of enlisting the services of a skilled psychanalyst

(2) the relatively long time necessary for the completion of the treatment

(3) the almost prohibitive cost of the treatment

Where psychanalytic treatment is impossible, usually because of financial considerations, the stammerer can sometimes be helped by one or more of the following measures:

*Auto-suggestion.* Assure the stammerer that his malady is due entirely to fear—fear that can be overcome by right thinking. Require the patient to say to himself again and again, with genuine conviction:

"I CAN speak easily and fluently!"
"I WILL conquer my fear!"
"I AM conquering my fear!"
"My fear is entirely imaginary."
"I am speaking with ever increasing CONFIDENCE!"

Assure the patient that courageous development of his will must inevitably result in the alleviation, if not the complete cure, of his malady.

*Hypnotic Suggestion.* Assure the patient that the

treatment about to be initiated will result in the immediate alleviation and the ultimate complete cure of his malady. Then place him in the hands of a competent psychologist who has mastered the technique of hypnosis. The latter will endeavor to place the patient in one of the deeper stages of hypnosis. If he succeeds in this, he will then administer suggestion to the patient in the form of a series of dynamically uttered, positive declarations. E. g.—

"As a result of this treatment you will be able to speak fluently!"

"You are much better already!"

"When I wake you up you will be able to speak quite fluently!"

"Your fear of speaking is imaginary!"

"After this treatment you will no longer be bothered by the fear of speaking!"

"You have already gained in confidence!"

"You can conquer stammering!"

"You will not stammer any more!"

The hypnotist will continue to administer this sort of suggestion in hour sessions two or three times a week until the patient either stops stammering or begins to show a very marked improvement.

*Distraction with Hetero-suggestion.* Assure the patient that the treatment about to be initiated will certainly alleviate and probably completely cure his malady. Then utilize as many of the following devices as may prove necessary or useful to distract the patient's attention during speech from his customary perception of neurotic dread, building up the patient's confidence in the curative efficacy of these methods during the process:

(a) Have the patient practise talking in time to the slow beat of a metronome, uttering one syllable to each beat.

(b) Have the patient practise talking while he varies the pitch of his voice in accordance with some specified melody pattern.

(c) Have the patient practise elongating all vowels in his utterances. E. g.—*Gooooo tooooo theeeee cooooorneeeeer quiiiiickleeeee!*

(d) Have the patient practise talking while he varies the volume of his voice in an arbitrarily specified manner. Have the patient, for example, whisper one word, say the next in a normal voice, then shout the next, etc.

(e) Have the patient practise breath-grouping his utterances in novel ways (e. g.—*one word in the first breath group, two in the second, three in the third, four in the fourth, one in the next, etc., etc.*).

(f) Have the patient practise summoning up a vivid visual or auditory image to accompany each word he utters.

(g) Inform the patient how the organs of speech are adjusted for the production of the various sound units of standard English—particularly those sounds which he finds unusually difficult to utter. Then assure him that, armed with this information, he will now be able to conquer his malady with relative ease. Finally, drill the patient in summoning up vivid motor images to accompany utterance of the sound units of his speech.

(h) Have the patient relax all the muscles of his body before speaking and then supplement this by easy, rhythmic breathing during speech.

**Suggestion vs. Psychanalysis.** Experience has shown that stammering "cures" won thru suggestion, whether auto-, hetero-, or hypnotic, are few and rarely permanent. Suggestion in its most efficacious form can act merely to temporarily block the outward manifestation of the repressed mental processes responsi-

ble for the stammerer's malady. The processes themselves persist, because they have not been reached and dealt with, and tend eventually to reassert themselves in either the old or a new symptom.

Ernest Jones, one of the present-day leaders in psychopathological research, uses the analogy of a suppurating sinus to explain the part played by suggestion in the treatment of a psychoneurotic symptom. If a suppurating sinus is forcibly plugged, Jones points out, then the symptom of discharging pus is removed—temporarily! But sooner or later the pent-up pus will find vent, either in the same, or in a new direction. The same is true of the treatment for stammering. The psychic channel thru which a repressed mental process must flow in order to manifest itself as the disease-symptom of stammering can be forcibly "plugged" by suggestion, and the disease symptom thus suddenly and sometimes apparently miraculously removed. But sooner or later the effect of the suggestion will wear off, and the stammering symptom will reappear or else a new *and perhaps even more embarrassing* symptom will develop.

In the treatment of both stammering and suppurating sinuses, a proper technique ignores the symptom and concerns itself with the *cause*—treats the focus of the disease rather than its surface manifestations. Before proper healing of a suppurating sinus can take place, a pathologic physical tension must be relieved thru the institution of free drainage for each pus pocket. Before a case of stammering can be permanently cured, a pathologic psychic tension must be relieved thru the uncovering of repressed mental processes and the discharge of pent-up emotions.

In short, psychanalysis rather than suggestion should always be recommended as the therapeusis for stammering. Only where the former is out of the question because of financial considerations is the latter ever advisable. And even then it holds out but scant hope of worthwhile results except in very light cases.

## (2) LEVEL INTONATION

Level intonation encountered in connection with functional nervousness (*neurotic monotone*) can often be corrected by a purely pedagogic process of voice reproduction and direct imitation (see page 206 for the details of procedure). If this process fails to obtain satisfactory results the patient should be referred, circumstances permitting, to a skilled psychanalyst.

## (3) APHONIA

Aphonia encountered in connection with functional nervousness (*hysterical aphonia*) generally defies all but skilled psychanalytic treatment. Suggestive therapeutics in this case holds out little hope of a cure.

THE END

# BIBLIOGRAPHY

The authors are glad to recommend the following texts as the nucleus of a reference library for students of speech correction. The texts have been carefully selected as being (1) pertinent to the subject, (2) authoritative, (3) clear in exposition, (4) modern and (5) available.

### *Anatomy and Physiology of the Speech Mechanism*


1. Anatomy of the Human Body, Henry Gray. Lea and Febiger, Philadelphia.
2. Text Book of Anatomy, Daniel J. Cunningham. William Wood and Co., New York.
3. Human Anatomy, George A. Piersol. J. B. Lippincott Co., Philadelphia.
4. Essentials of Physiology, Bainbridge and Menzies. Longmans, Green and Co., New York.
5. Principles of Human Physiology, Ernest Starling. Lea and Febiger, Philadelphia.
6. Hand-Book of Physiology, Halliburton. P. Blakiston Sons and Co., Philadelphia.


The preceding texts discuss the general anatomy and physiology of the human organism, dealing with the anatomy and physiology of the speech mechanism only as incidental to this main discussion. For an independent treatment of the anatomy and physiology of the speech mechanism, we recommend—


7. The Organs of Speech. Meyer. D. Appleton and Co, New York.

*Pathology of the Speech Mechanism*

1. Diseases of the Nose, Throat and Ear, William Ballenger. Henry Kimpton, London.
2. Diseases of the Nose and Throat, C. G. Coakley. Lea and Febiger, Philadelphia.
3. Diseases of Nose and Throat, St. Clair Thompson. D. Appleton and Co., New York.
4. Oto-Rhino-Laryngology, Georges Laurens. William Wood and Co., New York.
5. Nose, Throat and Ear, A. Logan Turner. William Wood and Co., New York.
6. Prosthetic Dentistry, Turner. Lea and Febiger, Philadelphia.
7. Diseases of the Nose, E. B. Waggett. Oxford University Press.

Of the preceding texts, the two perhaps best suited for study by the lay investigator are "Oto-Rhino-Laryngology" by Laurens and "Diseases of the Nose" by Waggett.

*Phonetics*

1. The Pronunciation of English, Daniel Jones. Cambridge University Press.
2. Elements of Phonetics, Vietor (translated and adapted by Walter Ripman). E. P. Dutton and Co., New York.
3. The Sounds of Spoken English, Walter Ripman. E. P. Dutton and Co., New York.
4. A Modern English Grammar, Jesperson. Winter, Heidelberg.
5. The Science of Speech, Dumville. Warwick and York, Inc., Baltimore.

For the clearest and most comprehensive exposition of the principles of phonetics we recommend the "Science of Speech" by Dumville; for simplicity of treatment and for

the most authoritative analysis of standard English, "The Pronunciation of English" by Daniel Jones; for the most effective use of diagrams in phonetic expositions, "Elements of Phonetics" by Vietor.

*Treatment of Stammering*

1. Real Cause of Stammering and its Permanent Cure, Alfred Appelt. Methuen and Co., Ltd., London.
2. Psychanalysis—Theory and Practical Application, A. A. Brill. W. B. Saunders, Philadelphia.
3. Conditions of Nervous Anxiety, William Stekel. Dodd, Mead and Co., New York.
4. The Technique of Psychanalysis, David Forsyth. Kegan Paul, Trench, Trubner and Co., London.

Appelt is the only one of the authors listed above who deals with stammering as an independent problem. The other authors discuss the subject only as a part of the larger problem of functional nervous disturbances in general.

# INDEX

## Speech Correction

**Date Due**